ISSUE REPORT

Ready or Not?

PROTECTING THE PUBLIC'S HEALTH FROM DISEASES, DISASTERS, AND BIOTERRORISM 2007

DECEMBER 2007

PREVENTING EPIDEMICS.
PROTECTING PEOPLE.

Trust for America's Health
WWW.HEALTHYAMERICANS.ORG

Trust for America's Health is a non-profit, non-partisan organization dedicated to saving lives by protecting the health of every community and working to make disease prevention a national priority.

Acknowledgements:

This report is supported by a grant from the Robert Wood Johnson Foundation. The opinions expressed in this report are those of the authors and do not necessarily reflect the views of the foundation.

Report Authors

Jeffrey Levi, PhD
Executive Director
Trust for America's Health

Serena Vinter, MHS
Lead Author and Health Policy Research Associate
Trust for America's Health

Laura M. Segal, MA
Director of Public Affairs
Trust for America's Health

Contributors

Emily Gadola, MPP
Public Affairs Research Associate
Trust for America's Health

Sara Rosenbaum, JD
Hirsch Professor and Chair Department of Health Policy
The George Washington University School of Public Health and Health Services

Michael R. Taylor, JD
Research Professor of Health Policy
The George Washington University School of Public Health and Health Services

Mary Elizabeth Harty, MPH
Department of Health Policy
The George Washington University School of Public Health and Health Services

Jennifer Sheer
Department of Health Policy
The George Washington University School of Public Health and Health Services

Peer Reviewers

TFAH thanks the reviewers for their time, expertise, and insights. The opinions expressed in this report do not necessarily represent the views of these individuals or their organizations.

Scott J. Becker, MS
Executive Director
Association of Public Health Laboratories

James S. Blumenstock
Chief Program Officer Public Health Practice
Association of State and Territorial Health Officials

Jonathan E. Fielding, MD, MPH
Director and Health Officer
Los Angeles County Department of Public Health

Jonathan E. Freedman
Director, Emergency Preparedness and Response
Los Angeles County Department of Public Health

Elin A. Gursky, ScD
Principal Deputy for Biodefense
ANSER/Analytic Services, Inc.

Margaret A. Hamburg, MD
Senior Scientist
Nuclear Threat Initiative (NTI)

Jennifer B. Nuzzo, SM
Center for Biosecurity
University of Pittsburgh Medical Center

Irwin Redlener, MD
Associate Dean and Director, National Center for Disaster Preparedness
Columbia University, Mailman School of Public Health

Terri Rebmann, PhD, RN, CIC
Associate Director for Curricular Affairs Assistant Professor Institute for Biosecurity
Saint Louis University, School of Public Health

TABLE OF CONTENTS

Introduction

Six years after the tragedies of September 11th and the proceeding anthrax scares of 2001, more than half of all Americans do not believe the country is safer than before the attacks.[1] Two years after Hurricane Katrina, nearly 60 percent of Americans do not think their community would be prepared to respond to a natural disaster.

This report finds that on some measures, significant progress has been made in the nation's preparedness. There are important areas, however, where continued, concerted action is needed. From assuring an adequate stockpile of pandemic influenza countermeasures to having a public health workforce large enough and trained enough to respond to an emergency, federal and state policies still fall short of their stated goals.

Almost half the states do not provide sufficient legal protection from liability for health care volunteers who respond to the nation's call for assistance in an emergency. In many other areas, a lack of transparency makes it hard for the American people and their elected representatives to know whether their government is protecting them. The variation in preparedness among the states, while not as great as in past years, does mean that where one lives still determines how well one is protected. Until all states measure up, the United States is not safe.

Furthermore, just as the nation is beginning to see a return on the federal investment in preparedness, funding to states and localities to maintain and improve their preparedness is declining. Overall, federal funding for state and local preparedness will have declined by 25 percent in 3 years if the President's FY 2008 request is approved. Further, unless Congress and the President act, funding for states and localities for pandemic influenza preparedness will expire in 2008.

Health emergencies pose some of the greatest threats to the nation. Acts of bioterrorism and natural outbreaks of disease are challenging to detect and contain. In addition, natural disasters often cause health problems that are difficult to predict and prepare for.

Since 2003, Trust for America's Health (TFAH) has issued the *Ready or Not? Protecting the Public's Health from Diseases, Disasters, and Bioterrorism* report to examine the progress that has been made to improving America's ability to respond to health threats and help identify ongoing areas of vulnerability. Some of the key areas of concern TFAH has raised include the need to:

- Increase accountability;
- Strengthen leadership;
- Enhance surge capacity and the public health workforce;
- Modernize technology and equipment; and
- Improve community engagement.

A MODERN PUBLIC HEALTH SYSTEM TAKES ON ALL HAZARDS

There has been increasing acknowledgement among America's leaders and current and former public health officials about the need to modernize the public health system to respond to a range of threats, including naturally occurring diseases and disasters, as well as bioterrorism. The aftermath of Hurricane Katrina, the potential for a pandemic flu outbreak, increased attention to foodborne illnesses, and growing concern about drug-resistant bugs such as methicillin-resistant *Staphylococcus aureus* (MRSA) have contributed to a better understanding of the need for an all-hazards approach to public health preparedness.

In December 2006, the U.S. Congress took steps to address many of these concerns when legislators updated and reauthorized the Public Health Security and Bioterrorism Act, which became the Pandemic and All-Hazards Preparedness Act (PAHPA). In addition, the White House issued a number of presidential directives with components aimed at improving public health emergency preparedness. The most recent was Homeland Security Presidential Directive/HSPD 21, released in October 2007, which establishes a National Strategy for Public Health and Medical Preparedness.

The next challenge is to ensure that the measures in the legislation and directives are carried out and translated into improved public health preparedness, thereby keeping communities throughout the country safer and better protected. This will require sufficient funding from the president and U.S. Congress to carry out federal preparedness activities. Another challenge is to address funding levels for upgrading state and local public health preparedness, which have been decreasing yearly since 2004. This has adversely affected progress.

The 2007 edition of the *Ready or Not?* report focuses on evaluating America's public health emergency preparedness in the context of these measures by the U.S. Congress and the Bush Administration to try to improve all-hazards preparedness.

Currently, the federal government does not release preparedness progress or evaluation reports to the public, so TFAH issues this report in order to provide an independent analysis to:

- Inform the public and policymakers about progress and vulnerabilities in the nation's public health preparedness; and
- Foster greater accountability for the spending of taxpayer dollars on preparedness.

The U.S. Congress and the public are entitled to know how well the country is being protected from health threats. And, the public health system and other government entities involved in protecting the public's health must be held accountable for how well they are carrying out their responsibilities as defined by legislation and federal directives.

In addition, without information about the status of progress and vulnerabilities, it is difficult to determine whether the resources and funds devoted to preparedness are sufficient for adequately protecting the public from health threats.

READY OR NOT? 2007: MAJOR CONCLUSIONS

The 2007 *Ready or Not?* report finds significant progress among the states in those areas where data are available. Indeed, overall scores for the states have risen from prior years. This reflects a combination of factors, including a major infusion of funding from the federal government to states and localities and a higher priority on pandemic influenza preparedness among state and local health departments.

Not all areas of preparedness, however, can be measured by the indicators included in this report because data from all levels of government is still insufficient. Even within these indicators, some important geographic disparities are identified that affect the nation's ability to protect Americans from emergency health threats – particularly with respect to plans for the distribution of emergency countermeasures from the Strategic National Stockpile and providing liability protections for volunteer health workers.

***Ready or Not? 2007*: Key Findings**

Indicator	Finding
Mass Distribution -- Strategic National Stockpile	13 states do not have adequate plans to distribute emergency vaccines, antidotes, and medical supplies from the Strategic National Stockpile (SNS)
Mass Distribution -- Antiviral Stockpiling	7 states have not purchased any portion of their federally-subsidized or unsubsidized antivirals.
Public Health Laboratories -- Bio-Threat Testing	7 states and D.C. lack sufficient capabilities to test for biological threats.
Public Health Laboratories -- Workforce Surge Preparedness	2 states and D.C. report their public health laboratories do not have the capability to provide 24/7 coverage to analyze samples.
Biosurveillance	12 states do not have a disease surveillance system that is compatible with the Centers for Disease Control and Prevention's (CDC) National Electronic Disease Surveillance System (NEDSS).
Healthcare Volunteer Liability Protection	21 states do not have statutes that address one or both of 2 critical legal elements to extend liability protection to healthcare volunteers during emergencies.
Emergency Preparedness Drills	50 states and D.C. held an emergency preparedness drill or exercise in 2007 with health department officials and the state National Guard.
Community Resiliency	13 states do not meet a minimum threshold for Medical Reserve Corp volunteers for every 100,000 citizens.
Public Health Progress -- Seniors' Seasonal Flu Vaccination	Flu vaccination rates for seniors decreased in 11 states.
Funding Commitment	6 states cut their public health budgets between FY 2005-06 and FY 2006-07.

Some of the Federal Undertakings Since the *Ready or Not? 2006* Report:	
December 2006	Passage of the Pandemic and All-Hazards Preparedness Act.
February 2007	U.S. Government releases guidance for non-pharmaceutical interventions (NPIs) for mitigating the impact of a pandemic.
April 2007	U.S. Government approves the first pre-pandemic vaccine for humans against the H5N1 virus.
June 2007	Strategic National Stockpile contains more than 36 million treatment courses of antiviral drugs; 971,000 on order; individual states have stockpiled some 18 million treatment courses.
July 2007	U.S. Homeland Security Council releases a year-one evaluation of the National Strategy for Pandemic Influenza Implementation Plan.
October 2007	White House issues Homeland Security Presidential Directive/HSPD 21 establishing a National Strategy for Public Health and Medical Preparedness.

CONTENTS OF THE *READY OR NOT? 2007* REPORT

- **Section A:** State-by-state public health preparedness. States are evaluated on 10 preparedness indicators, based on input and review from public health experts;
- **Section B:** The federal government's implementation of the 2006 Pandemic and All-Hazards Preparedness Act (P.L. 109-417) which sets benchmarks and deadlines for key actions. Federal leadership and preparedness funding and accountability are also discussed;
- **Section C:** A survey of hospital emergency preparedness;
- **Section D:** A public opinion survey on pandemic and all-hazards preparedness;
- **Section E:** Discussion of some additional preparedness issues, including public health workforce, vulnerable populations and emergency preparedness, caring for children during disasters, mental health considerations, and drug resistant bacteria; and
- **Section F:** Recommendations for improving all-hazards emergency preparedness.

Summary of Key Preparedness Landmarks and Concerns	
Federal Legislation and Funding	**Progress:** ▲ The Pandemic and All-Hazards Preparedness Act of 2006 was passed, providing a blueprint for federal preparedness including key deliverables and due dates. ▲ The Homeland Security Presidential Directive/HSPD 21 was issued setting a National Strategy for Public Health and Medical Preparedness and reaffirming the blueprint laid out in PAHPA. **Concerns:** ▲ State, local, and hospital emergency preparedness funding has been cut over the years and remains inconsistent, which hampers state and local preparedness initiatives and threatens progress that has already been made.

Summary of Key Preparedness Landmarks and Concerns

Accountability, Oversight, and Transparency	**Progress:** ▲ The federal government issued 2 important progress reports in 2007 -- the *National Strategy for Pandemic Influenza: Implementation Plan* and the *Pandemic and All-Hazards Preparedness Act Progress Report* -- that provide the public with information needed to assess federal progress on both fronts. ▲ CDC plans to issue the first of what will become annual reports on state and local preparedness. Scheduled to be published in late 2007/early 2008, the CDC report will outline the progress that has been made, challenges that still remain, and how CDC is working to address these challenges. The report will cover disease detection and investigation; public health laboratory testing, and response; and, individual state and locality fact sheets. ▲ In response to PAHPA, HHS reorganized and created the new position of Assistant Secretary for Preparedness and Response (ASPR) that has authority over the National Disaster Medical System (NDMS), Hospital Preparedness Cooperative Agreement, Medical Reserve Corps (MRC), Emergency System for the Advance Registration of Volunteer Health Professionals (ESAR-VHP), Strategic National Stockpile (SNS), and Cities Readiness Initiative (CRI). The ASPR position is accountable for all public health emergency preparedness programs, which should improve leadership and oversight. ▲ Federal agencies are in the process of developing new, out-come-oriented performance measures that will begin to roll out in 2008. ▲ All 50 states and D.C. submitted revised pandemic plans in April 2007 based on criteria from HHS. ▲ HHS has refined its state pandemic planning criteria based on feedback from states and will re-distribute those to state agencies ahead of the next round of pandemic planning. ▲ HHS will begin to withhold funding from entities that fail to achieve benchmarks or submit influenza plans. ▲ HHS will require states and hospitals that receive public health emergency preparedness funding to submit annual reports meeting specific requirements to evaluate activities and assure the proper expenditure of funds. **Concerns:** ▲ A 2007 GAO report found that, despite the creation of the ASPR, clear leadership roles are still not defined in the National Pandemic Influenza Strategy. ▲ CDC only collects data on 6 of 23 current performance-measures, which focus too heavily on self-reported, non-objectively verifiable data, and on planning and process versus implementation and outcomes. ▲ CDC and ASPR have failed to provide any public evaluation of preparedness or pandemic planning on a state-by-state basis. The lack of transparency limits the ability to gauge progress and identify vulnerabilities in the nation's preparedness for all-hazards public health emergencies.

Summary of Key Preparedness Landmarks and Concerns	
Gaps in "Plans on Paper" Versus Reality of Preparedness	**Progress:** ▲ ASPR, in coordination with research organizations and universities, is developing new tools to assess state and local preparedness using embedded assessments and full-scale drills and exercises. **Concerns:** ▲ There remains limited, non-systematic testing and exercising of emergency health plans, and inconsistent mechanisms for incorporating lessons learned into future planning. ▲ State and federal preparedness documents acknowledge the difficult issues related to licensing and credentialing of emergency healthcare volunteers but efforts to address these issues remain scattered. ▲ Federal and state plans highlight the importance of reaching out to at-risk populations, including the elderly and low-income minorities. Surveys show, however, that these groups have the least confidence in the government's ability to respond to a disaster.
Laboratory Improvements	**Progress:** ▲ States continue to make progress in developing bio-safety level 3 (BSL-3) laboratory capacities by adding additional suites or labs to meet testing needs. **Concerns:** ▲ Adequate levels of trained personnel continue to limit laboratories' ability to provide 24/7 coverage to analyze samples.
Public Health Information Technology	**Progress:** ▲ States continue to develop components essential for compatibility with CDC's National Electronic Disease Surveillance System (NEDSS), allowing for more integrated, accurate, and timely national disease reporting. ▲ States are linking public health surveillance systems with poison control centers. **Concerns:** ▲ HHS failed to meet the June 2007 due date to deliver its strategic plan outlining steps to develop, implement, and evaluate a near real-time electronic nationwide public health situational awareness capability network. ▲ Three years into its development, BioSense still lacks real-time capability and is prone to issuing false alarms. ▲ CDC reports that there are 6 IT system developers whose various products are used by the 50 state and 3,000 local health departments nation-wide. Integrating the disparate systems so that data can be shared is a serious barrier to the development of a near real-time electronic nationwide public health situational awareness capability.
State Public Health Funding	**Progress:** ▲ A large majority of states increased their funding for public health from FY 2005-2006 to FY 2006-2007. **Concerns:** ▲ Median state spending for public health is only $33 per person per year, representing only a $2 increase per person over last year's median spending amount ($31).

Summary of Key Preparedness Landmarks and Concerns	
Problems with Management and Contents of the Strategic National Stockpile (SNS)	**Progress:** ▲ CDC is using a new Technical Assistance Review (TAR) Tool to determine a project area's ability to respond to a public health emergency that requires the use of SNS assets. The State TAR tool is used to evaluate a state's ability to receive, stage, store, and distribute SNS assets during a public health emergency. The Local TAR tool is used to assess a city, county, or metro area's ability to receive, manage and dispense SNS assets. Both review tools are based on a 100-point system. **Concerns:** ▲ The new CDC evaluation system still relies on an evaluation of paper-plans instead of an actual assessment of a state's ability to distribute medicine and supplies in an emergency. ▲ States still have not received clear information about the quantities of medications and supplies that are in the SNS and how effective the federal government would be in delivering supplies to states during a multi-state crisis. ▲ The federal government has stockpiled only 6,000 treatment courses of pediatric antivirals for influenza. There are 73.6 million children in the U.S. ▲ Beginning in 2008, several lots of the anthrax vaccine BioThrax will begin to expire, which could cost the SNS $100 million in lost stockpile in FY 2008 and FY 2009.
Extremely Limited Surge Capacity for Emergencies	**Progress:** ▲ A majority of hospitals report they have either established plans or been involved in state and local planning efforts to prepare for a surge of excess patients by planning to use alternative care sites such as schools, conference centers, hotels, and sports arenas. ▲ Two major reports on surge capacity and hospital preparedness were published in 2007. In April CDC's Injury Center published *In a Moment's Notice: Surge Capacity for Terrorist Bombings: Challenges and Proposed Solutions*, and in October PriceWaterhouseCooper's published *Closing the Seams: Developing and Integrated Approach to Health System Disaster Preparedness.* Both reports contain consensus-based recommendations for improving U.S. surge capacity. **Concerns:** ▲ According to the Center for Biosecurity, the minimum costs of developing and maintaining surge capacity during a severe pandemic for an average size hospital are close to a $1 million one-time investment coupled with $200,000 in annual maintenance costs. Current ASPR-funding levels are closer to approximately $100,000 per year per hospital. ▲ The public health workforce and healthcare workforce shortages continue to worsen. ▲ Ongoing concerns exist about policies and incentives designed to encourage healthcare workers to report for duty during an emergency. ▲ Volunteer medical workforce efforts are limited by concerns regarding liability and licensing.

Summary of Key Preparedness Landmarks and Concerns 2001	
Community Resilience*	**Progress:** ▲ Responding to "at-risk" populations was made a priority under PAHPA. ▲ The federal government has developed and run several public service announcements on emergency and pandemic preparedness for individuals and families; September is now designated as "National Preparedness Month." ▲ PAHPA singled out "risk communication and public preparedness" as "essential public health security capabilities," and it made state and local preparedness awards contingent upon an explicit mechanism, such as an advisory committee, "to obtain public comment and input" on emergency plans and their implementation. ▲ HSPD-21 identified community resilience as one of the "4 most critical components of public health and medical preparedness," along with biosurveillance, countermeasure distribution, and mass casualty care. **Concerns:** ▲ Public engagement in emergency planning remains low. ▲ The National Advisory Committee on Children and Terrorism, which the U.S. Congress established in 2002, expired after one year. Under PAHPA the needs of children are lumped together with "at-risk" populations. ▲ State and local preparedness grants place a priority on mass risk communication capabilities rather than the time and labor-intensive techniques for actively engaging local opinion leaders and civic groups in preparedness (i.e., community engagement).

** The U.S. government defines "community resilience" as the ability of a community to cope and recover from a disaster or public health emergency. This requires residents, community-based organizations, local businesses, and government to take meaningful action before a disaster or emergency.*

Some Key 2007 Public Health Threats	
February 2007	Salmonella contamination in peanut butter.
May 2007	CDC announces that patient with suspected extensively drug-resistant-Tuberculosis (XDR-TB) travels to Europe and back, prompting an international public health scare.
August 2007	Massive recall after lead paint found in toys made in China.
September 2007	Cumulative bird flu deaths among humans top 200; case fatality rate greater than 60 percent.
October 2007	■ E.Coli contamination in frozen hamburger meat prompts third largest hamburger recall in USDA history. ■ California wildfires force evacuation of some 350,000 from homes and close 2 hospitals, which requires establishment of emergency medical response capabilities at shelters and public health response to diminished air quality. ■ CDC reports that methicillin-resistant *Staphylococcus aureus* (MRSA) is responsible for more than 94,000 serious infections and nearly 19,000 deaths each year. CDC identifies MRSA as "a major public health problem primarily related to health care, but no longer confined to intensive care units, acute care hospitals, or any health care institution."[2]

2006 PANDEMIC AND ALL HAZARDS PREPAREDNESS ACT

The December 2006 passage of the Pandemic and All-Hazards Preparedness Act (P.L. 109-417) made headway in addressing some of the concerns Trust for America's Health has raised in past *Ready or Not?* reports.

Accountability

Past TFAH Recommendation: The federal government must establish measurable, basic preparedness standards for which all states should be held accountable. The performance measures should include objective assessments and be able to gauge improvement on an ongoing basis.

The PAHPA Legislation:

- Directs the Department of Health and Human Services to establish concrete performance measures;
- Requires tabletop exercises including outcomes measures, lessons learned, and future planning; and
- Limits carry-over funding, and returns unspent state preparedness funds to the HHS Secretary, who awards it to the Hospital Preparedness Program in the state it was returned from.

Leadership

Past TFAH Recommendation: Increased leadership and oversight is needed for U.S. bioterrorism and public health emergency preparedness. TFAH has urged HHS to designate one person accountable for all public health emergency preparedness programs. TFAH has also advocated for state preparedness funding to be linked to state performance measures.

The PAHPA Legislation:

- Establishes the newly created position of Assistant Secretary for Preparedness and Response (ASPR) who has authority over the National Disaster Medical System (NDMS), Hospital Preparedness Cooperative Agreement, Medical Reserve Corps (MRC), Emergency System for the Advance Registration of Volunteer Health Professionals (ESAR-VHP), and who should exercise the responsibilities and authorities of the secretary with respect to the coordination of the Strategic National Stockpile (SNS) and Cities Readiness Initiative (CRI); and
- Directs state grantees to submit to the HHS secretary regular reports regarding the annual conduct of drills and grantees' performance on said drills based on standards defined by the secretary, in addition to other information.

Surge Capacity and Workforce

Past TFAH Recommendation: Federal government initiatives must be taken to recruit a new generation to the public health workforce, while expanding the volunteer healthcare workforce that would be called upon during an emergency.

The PAHPA Legislation:

- Authorizes a public health workforce demonstration project for a loan repayment program. Eligible participants are health professionals who agree to serve in a state health department that services a significant number of health professional shortage areas or areas that are at risk of a public health emergency.

Modernizing Technology and Equipment

Past TFAH Recommendation: Basic technology and tools of public health must be modernized. This includes enhanced research and development of vaccines and new diagnostic tests, improved laboratory testing capabilities, and modernized surveillance systems.

The PAHPA Legislation:

- Requires the HHS secretary to develop and publish a strategic plan to integrate biodefense and emerging infectious disease requirements with advanced research and development; and
- Establishes the Biomedical Advanced Research and Development Authority (BARDA) under HHS to facilitate collaboration among HHS, other federal agencies, industry, and academia to promote and financially support countermeasures.

Public Partnering

Past TFAH Recommendation: Federal planning efforts must do a better job of recognizing the roles and concerns of the media, the general public, and the business community. Risk communication and emergency planning activities need to include all segments of the population to ensure their voices are heard and incorporated.

The PAHPA Legislation:

- Addresses the needs of at-risk individuals and directs HHS officials to consider these vulnerable populations when managing programs such as the SNS and preparedness grants to states; and
- Makes preparedness awards to state and local health agencies contingent upon an explicit mechanism, such as an advisory committee, "to obtain public comment and input" on preparedness and response plans and their implementation.

HOMELAND SECURITY PRESIDENTIAL DIRECTIVE (HSPD 21)

Issued on October 18, 2007, HSPD 21 establishes a *National Strategy for Public Health and Medical Preparedness.* The directive is the most recent in a series of executive orders issued since September 11, 2001, to protect the nation in the event of terrorist attacks or other catastrophic health events. The directive has 4 key parts: biosurveillance, countermeasure distribution, mass casualty care, and community resilience.[3] The strategy echoes many of the requirements set forth in PAHPA and affirms the importance of the all-hazards approach to public health emergency preparedness. In addition, it establishes the Public Health and Medical Preparedness Task Force, which will prepare and submit to the president an Implementation Plan for the strategy within 120 days after the date of the directive (mid-February 2008). The cabinet-level government Task Force will also submit yearly status reports on the implementation plan and suggest changes to HSPD 21.

The White House issued HSPD 21 just days after updating the *National Strategy for Homeland Security* for the first time since September 11, 2001. The revised National Strategy for Homeland Security, issued on October 9, 2007, acknowledges the danger posed not only by terrorism but also by nature, and tries to build on the lessons learned from Hurricane Katrina.

> *"Indeed, certain non-terrorist events that reach catastrophic levels can have significant implications for homeland security. The resulting national consequences and possible cascading effects from these events might present potential or perceived vulnerabilities that could be exploited, possibly eroding citizens' confidence in our nation's government and ultimately increasing our vulnerability to attack.* ***This strategy, therefore, recognizes that effective preparation for catastrophic natural disasters and man-made disasters, while not homeland security per se, can nevertheless increase the security of the homeland.***"[4]

ALL-HAZARDS APPROACH TO EMERGENCY PUBLIC HEALTH THREATS

The U.S. public health system is responsible for protecting the American people from a range of potential health threats. An all-hazards public health system is one that is able to respond to and protect citizens from the full spectrum of possible public health emergencies, including bioterrorism and naturally occurring health threats. An all-hazards system recognizes that preparing for one threat can have benefits that will help prepare public health departments for all potential threats.

Under an all-hazards approach, the public health system prepares for and is able to respond to unique concerns posed by different threats. For instance, threats may be:

- Isolated regionally or be national or global in scope;
- Of limited duration or occur in prolonged waves; and
- Preventable and treatable through vaccines and medications, or there may be no pharmaceutical interventions available.

EXAMPLES OF MAJOR EMERGENCY PUBLIC HEALTH THREATS

- **Agroterrorism:** The "deliberate introduction of an animal or plant disease with the goal of generating fear, causing economic losses, and/or undermining stability."[5] Agroterrorism can be considered a sub-category of "bioterrorism" and foodborne diseases.
- **Bioterrorism:** The intentional or deliberate use of germs, biotoxins, or other biological agents that cause disease or death in people, animals, or plants. Examples include anthrax, smallpox, botulism, salmonella, and *E. coli*.
- **Blast Injuries:** Explosions, whether deliberate or accidental, can cause multi-system, life threatening injuries among individuals and within crowds. Blunt and penetrating injuries to multiple organ systems are likely when an explosion occurs. Also, unique injuries to the lungs and central nervous system occur during explosions.
- **Chemical terrorism:** The deliberate use of chemical agents, such as poisonous gases, arsenic, or pesticides that have toxic effects on people, animals, or plants in order to cause illness or death. Examples include ricin, sarin, and mustard gas.
- **Chemical incidents and accidents:** The non-deliberate exposure of humans to harmful chemical agents, with similar outcomes to chemical terrorism.
- **Foodborne diseases:** Animal or plant diseases, which cause harm to humans. CDC estimates there are approximately 75 million pathogen-induced cases of foodborne diseases each year in the United States, causing approximately 325,000 hospitalizations and 5,000 deaths. Examples include botulism, salmonella, *E.coli* 0157:H7, shigella, and norovirus.
- **Natural disasters:** Harm can be inflicted during and after natural disasters, which can lead to the disruption of regular healthcare and leave portions of the population with ongoing care needs. Examples include hurricanes (such as Hurricane Katrina), earthquakes, tornados, mudslides, fires, and tsunamis.
- **Pandemic flu:** A novel, potentially lethal strain of the flu against which humans have no natural immunity. According to estimates from the U.S. Department of Health and Human Services (HHS), a severe pandemic could result in 1.9 million deaths and 9.9 million hospitalizations in the U.S.
- **Radiological threats:** Intentional or accidentally-caused exposure to radiological material. A terrorist attack could involve the scattering of radioactive materials through the use of explosives ("dirty bomb"), the destruction of a nuclear facility, the introduction of radioactive material into a food or water supply, and the explosion of a nuclear device near a population center.
- **Vector-borne diseases:** Diseases spread by vectors, such as insects. Examples include the West Nile virus, Rocky Mountain spotted fever, and malaria.
- **Waterborne diseases:** According to CDC, over 1,000 persons become ill from contaminated drinking water and over 2,500 persons become ill from recreational water disease outbreaks annually in the U.S.[6]
- **Zoonotic/Animal-borne diseases:** Animal diseases that can spread to humans, and in some cases can become contagious from human to human. Examples include Avian flu, rabies, and SARS.

WHAT DOES ALL-HAZARDS PREPAREDNESS LOOK LIKE?

The goals of 24/7 public health emergency response include:

- Rapid **detection** of emergency disease threats, including those caused by bioterrorism.
- Intensive **investigative** capabilities to quickly diagnose a rising disease threat or identify the biological or chemical agent used in an attack.
- **Surge capacity** for mass events, including adequate facilities, equipment, supplies, and trained health professionals.
- **Mass containment strategies**, including pharmaceuticals needed for **wide-scale vaccination, antibiotic, or antidote administration** and **isolation and quarantining** when necessary.
- Streamlined and effective **communication** channels so health workers can swiftly and accurately communicate with each other, other front line workers, and the public about 1) the nature of an emergency or attack, 2) the risk of exposure and how to seek treatment when needed, and 3) any actions they or their families should take to protect themselves.
- Communications must also be able to reach and take into consideration at-risk populations.
- An informed and involved public that can provide material and moral support to professional responders, and can render aid when necessary to friends, family, neighbors, and associates.

What it will take to achieve basic levels of preparedness:

- **Leadership, planning, and coordination:** An established chain-of-command and well defined roles and responsibilities for seamless operation across different medical and logistical functions and among federal, state, and local authorities during crisis situations, including police, public safety officials, and other first responders.
- **An expert and fully-staffed workforce:** Highly trained and adequate numbers of public health professionals, including healthcare providers, epidemiologists, lab scientists, and other experts, in addition to back-up workers for surge capacity conditions.
- **Modernized technology:** State-of-the-art laboratory equipment, information collection, and health tracking systems.
- **Pre-planned, safety-first rapid emergency response capabilities and precautions:** Tested plans and safety precautions to mitigate potential harm to communities, public health professionals, and first responders.
- **Immediate, streamlined communications capabilities:** Coordinated, integrated communications among all parts of the public health system, all frontline responders, and with the public. Must include back-up systems in the event of power loss or overloaded wireless channels.

FEDERAL, STATE, AND LOCAL PUBLIC HEALTH JURISDICTIONS

The federal role: Includes policymaking, the financing of activities, overseeing national disease prevention efforts, collecting and disseminating health information, building capacity, and directly managing some services.[7] Some public health capabilities, such as the Strategic National Stockpile (SNS), are federal assets managed by federal agencies that are available to supplement a state's and community's response to a public health emergency that overwhelms or may overwhelm their capabilities. Public health functions are widely diffused across 8 federal agencies and 2 offices.

State and local roles: Under U.S. law, state governments have primary responsibility for the health of their citizens. Constitutional "police powers" give states the ability to enact laws and issue regulations to protect, preserve, and promote the health, safety, and welfare of their residents. In most states, state laws charge local governments with responsibility for the health of their citizens.

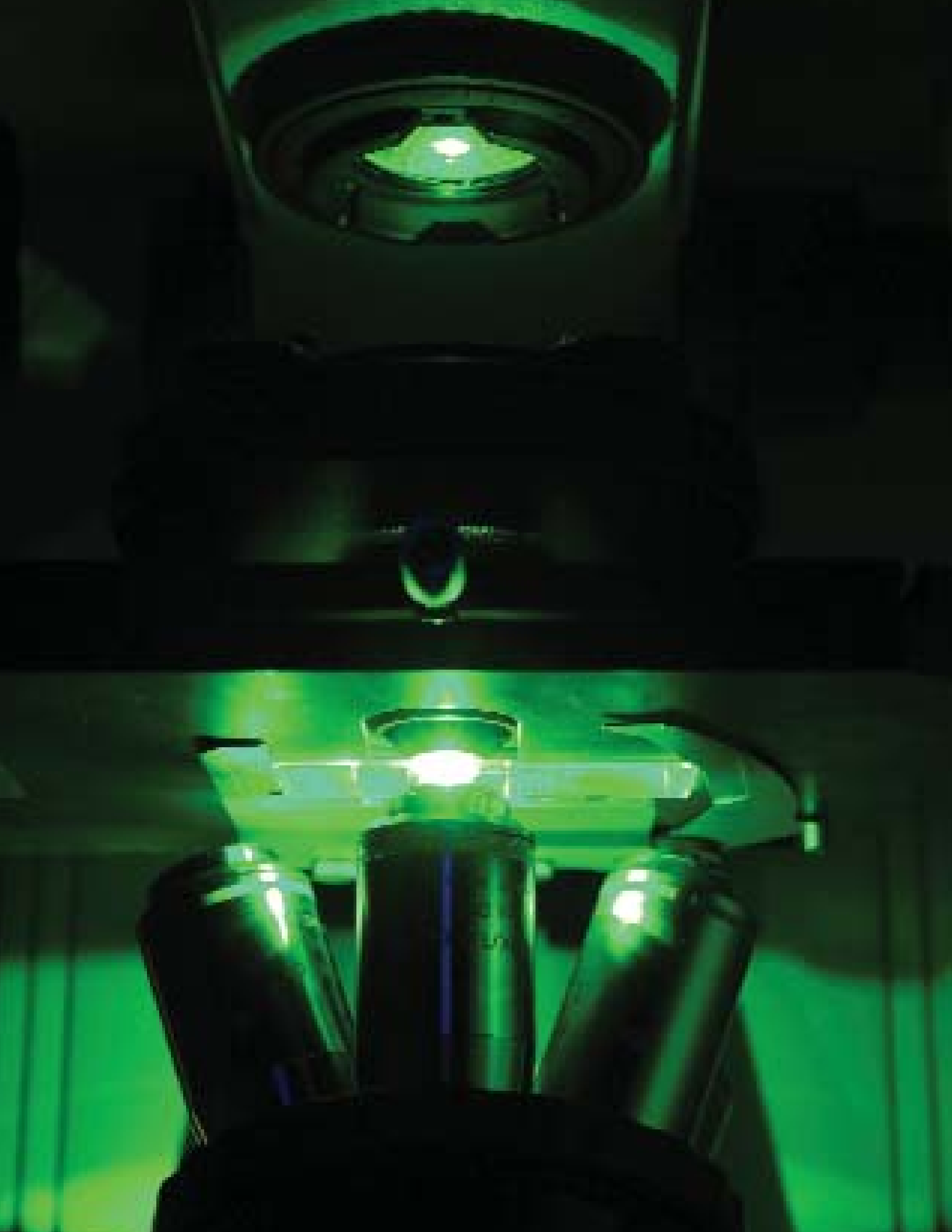
Some of the ongoing problems resulting from this diffused structure include:

1. Lack of clear roles for the various state, local, and federal agencies.
2. Differing responsibilities and capacities among the some 3,000 local health departments.
3. Limited coordination among the levels of government, including determination of how federal assets would be deployed to states and localities, and across jurisdictions, such as sharing assets and resources among states.
4. No minimum standards, guidelines, or recommendations for capacity levels or services are required of state and local health departments. This results in major differences in services and competencies across state and local agencies.
5. Lack of funding flexibility and comprehensiveness due to a federal funding structure that is largely based on categorical or program grants. These often restrictive grants also lack a system of accountability.
6. Ineffective and random capacity to coordinate with nongovernmental organizations, community groups, and the private sector.

Issues of Accreditation: In response to a 2002 Institute of Medicine (IOM) report that "called on the public health community to consider how accreditation ultimately could prompt improvements in the nation's health," the Association of State and Territorial Health Officials (ASTHO) and the National Association of County and City Health Officials (NACCHO), with funding from CDC and the Robert Wood Johnson Foundation, created the Exploring Accreditation Project. In the fall of 2006, the project's 25-member steering committee released a new model for a voluntary national public health accreditation program. Key recommendations included the development of accreditation standards to promote continuous quality improvement and accountability for public health, including performance measures.[8]

Some states have taken the lead in public health accreditation. For instance, in 2002, the North Carolina Division of Public Health and the North Carolina Association of Local Health Directors "undertook an initiative to develop a mandatory, standards-based system for accrediting local public health departments throughout the state."[9] The program consists of "an agency self[-]assessment, which includes 41 benchmarks and 145 activities; a 3-day site visit by a multidisciplinary team of peer volunteers; and determination of accreditation status by the North Carolina Local Health Department Accreditation Board."[10] As of July 2007, 30 local health departments in North Carolina have been accredited.[11]

In addition, the Multi-State Learning Collaborative II: Quality Improvement in the Context of Assessment and Accreditation Programs began as a follow-up project to the Multi-State Learning Collaborative for Performance and Capacity Assessment or Accreditation of Public Health Departments.[12] The project is funded by the Robert Wood Johnson Foundation and managed by the National Network of Public Health Institutes and the Public Health Leadership Society. In late 2006, 10 states -- Florida, Illinois, Kansas, Michigan, Minnesota, Missouri, New Hampshire, North Carolina, Ohio, and Washington -- were selected from a field of 21 applicants to assess quality improvement strategies to enhance the work of public health departments. The Collaborative's ultimate goal is to increase "the ability of public health agencies to protect and improve the health of the people in the communities they serve."[13]



SECTION 1

State-By-State Health Preparedness Indicators And Scores

> "Because the states are the seat of most authority for public health and medical preparedness, national preparedness for public health threats depends, in part, on the preparedness of individual states."
>
> — Congressional Research Service.[14]

All Americans have the right to expect fundamental health protections during public health emergencies, no matter where they live.

States and localities play the central role in protecting the public's health, whether in response to routine threats or emergencies, such as a bioterrorist attack or a natural disaster. Under the U.S. Constitution, each of the 50 states has primary legal jurisdiction and responsibility for the health of its citizens. Therefore, the chief focus of this report is the capacity of the states -- and the federal government's important role in developing that capacity. The federal government also plays a crucial role by providing leadership, scientific evidence, and critical resources to assure that every jurisdiction is adequately and equally prepared. (The federal role is discussed further in Section 2.)

Members of the public deserve to know how prepared their states and communities are for different types of health threats, particularly when their taxpayer dollars are being spent to support preparedness efforts. Currently, the American public is not equipped with enough information to monitor and hold public officials accountable for whether their communities are adequately prepared.

Every State is Different, but There Are Basic Expectations Every State Should Meet to Ensure Preparedness for All-Hazards

States differ in how they structure and deliver public health services. In some states, the public health system is centralized, and the state has direct control and supervision over local health agencies. In other states, local public health agencies developed separately from the state and are run by counties, cities, or townships, and usually report to one or more elected officials.[15]

Each state has different strengths, weaknesses, and unique challenges that affect its ability to prepare for and respond to public health emergencies. This report assesses how states are performing with respect to meeting their preparedness responsibilities.

To help assess public health emergency preparedness capabilities, each state received a score based on 10 key indicators, which TFAH derived from current publicly available data. Low state scores reflecting weaknesses and challenges are not intended to be punitive. Rather, this report is intended to help identify where and how states can improve or overcome obstacles to an all-hazards approach to public health preparedness. In addition, providing information about which states have particular strengths allows others to know which states to turn to for best practices and models to guide their own preparedness efforts.

State Scores

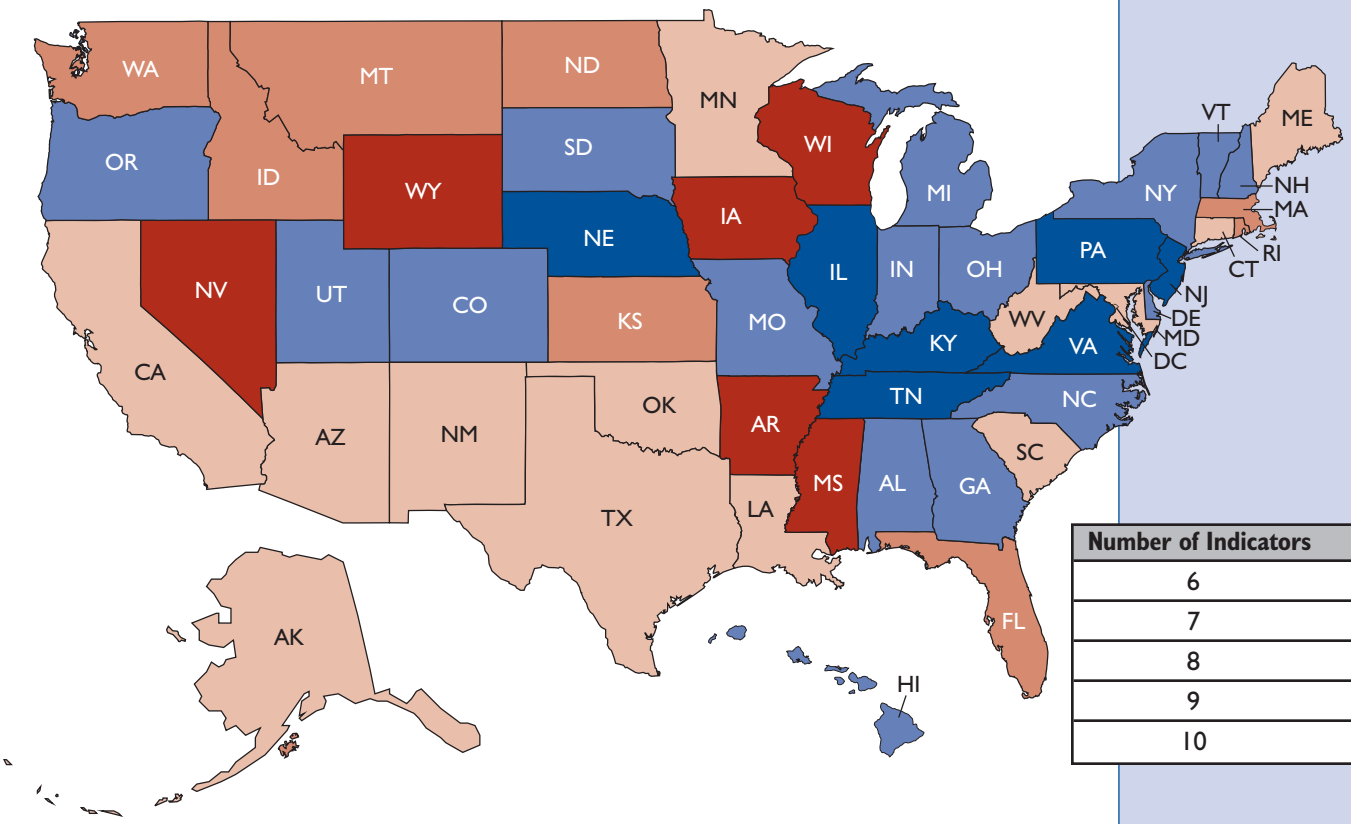
Despite allocation of more than $7 billion in federal public health preparedness funds to states and localities over the past 6 years, reliable, valid performance measures to evaluate emergency preparedness are lacking. What little data is collected on public health preparedness generally is not made publicly available.

TFAH, therefore, has annually developed 10 indicators focused on key areas of preparedness using the limited data currently available for all 50 states and the District of Columbia (D.C.). TFAH scored states on a scale of 0 to 10 in which states received one point for achieving an indicator or 0 points if they did not achieve the indicator. Zero was the lowest possible overall score and 10 the highest. Taken collectively, these indicators offer a composite snapshot of preparedness including strengths and vulnerabilities.

TFAH has repeatedly called for the government to develop national performance standards and to publicly release information on a routine basis about the states' performance in meeting these standards. The indicators in this report were selected based on:

- Reflection of a fundamental, systemic public health need;
- Consultation with key experts about areas important to serving basic public health emergency needs; and
- The availability of state level data that were verified through independent means or in consultation with states.

Scores focus on relative achievements in areas of preparedness, and highlight areas where increased prioritization and investment must be made to address problems. TFAH is only able to assess states comparatively where there are data available for all 50 states and D.C. Many states have taken action in other areas of preparedness or may be in the process of increasing certain capabilities not reflected in this report.



Number of Indicators	Color
6	
7	
8	
9	
10	

SCORES BY STATE

10 (7 states)	9 (15 states)	8 (13 states) & D.C.	7 (9 states)	6 (6 states)
Illinois	Alabama	Alaska	Florida	Arkansas
Kentucky	Colorado	Arizona	Idaho	Iowa
Nebraska	Delaware	California	Kansas	Mississippi
New Jersey	Georgia	Connecticut	Massachusetts	Nevada
Pennsylvania	Hawaii	D.C.	Montana	Wisconsin
Tennessee	Indiana	Louisiana	North Dakota	Wyoming
Virginia	Michigan	Maine	Rhode Island	
	Missouri	Maryland	South Dakota	
	New Hampshire	Minnesota	Washington	
	New York	New Mexico		
	North Carolina	Oklahoma		
	Ohio	South Carolina		
	Oregon	Texas		
	Utah	West Virginia		
	Vermont			

STATE PREPAREDNESS SCORES

States	1 Has adequate plans to distribute emergency vaccines, antidotes and medical supplies from the Strategic National Stockpile	2 Purchased a portion of their share of federally-subsidized or unsubsidized antivirals	3 Has sufficient capabilities to test for biological threats	4 Has capability to provide 24/7 coverage to analyze samples	5 Has a disease tracking system to collect and monitor data electronically via the Internet	6 Has laws that address one or both of 2 critical legal elements to extend liability to healthcare volunteers	7 Held an emergency preparedness exercise in 2007 with health department officials and the state National Guard	8 Met or exceeded 14 Medical Reserve Corp volunteers for every 100,000 citizens	9 Increased or maintained seasonal flu vaccination rate for adults over age 65	10 Increased or maintained level of funding for public health services from FY 2005-06 to FY 2006-07	2007 Total Score
Alabama	✓	✓	✓	✓	✓	✓	✓	✓		✓	9
Alaska	✓	✓	✓	✓			✓	✓	✓	✓	8
Arizona	✓	✓	✓	✓			✓	✓	✓	✓	8
Arkansas		✓	✓	✓			✓		✓	✓	6
California	✓	✓	✓	✓		✓	✓	✓		✓	8
Colorado	✓		✓	✓	✓	✓	✓	✓	✓	✓	9
Connecticut	✓		✓	✓		✓	✓	✓	✓	✓	8
Delaware	✓	✓	✓	✓	✓		✓	✓	✓	✓	9
District of Columbia	✓	✓			✓	✓	✓	✓	✓	✓	8
Florida	✓		✓	✓	✓		✓	✓		✓	7
Georgia		✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Hawaii		✓	✓	✓	✓	✓	✓	✓	✓	✓	9
Idaho	✓	✓		✓	✓		✓	✓		✓	7
Illinois	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Indiana	✓	✓	✓	✓	✓	✓	✓	✓	✓		9
Iowa	✓	✓		✓		✓	✓			✓	6
Kansas	✓	✓				✓	✓	✓	✓	✓	7
Kentucky	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Louisiana	✓	✓		✓	✓	✓	✓		✓	✓	8
Maine		✓	✓	✓	✓	✓	✓		✓	✓	8
Maryland		✓	✓	✓	✓		✓	✓	✓	✓	8
Massachusetts	✓			✓	✓		✓	✓	✓	✓	7
Michigan	✓	✓	✓	✓	✓	✓	✓		✓	✓	9
Minnesota	✓	✓	✓	✓		✓	✓	✓		✓	8
Mississippi	✓		✓	✓			✓		✓	✓	6
Missouri	✓	✓	✓	✓	✓	✓	✓		✓	✓	9
Montana	✓	✓	✓	✓	✓		✓		✓		7
Nebraska	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Nevada		✓	✓	✓	✓		✓		✓		6
New Hampshire	✓	✓	✓	✓		✓	✓	✓	✓	✓	9
New Jersey	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
New Mexico	✓	✓	✓	✓	✓		✓	✓		✓	8
New York	✓	✓	✓	✓	✓	✓	✓	✓	✓		9
North Carolina		✓	✓	✓	✓	✓	✓	✓	✓	✓	9
North Dakota			✓	✓	✓		✓	✓	✓	✓	7
Ohio	✓	✓	✓	✓	✓		✓	✓	✓	✓	9
Oklahoma	✓	✓	✓	✓	✓		✓	✓		✓	8
Oregon	✓	✓		✓	✓	✓	✓	✓	✓	✓	9
Pennsylvania	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Rhode Island	✓			✓	✓		✓	✓	✓	✓	7
South Carolina		✓	✓	✓	✓	✓	✓	✓		✓	8
South Dakota		✓	✓	✓	✓	✓	✓			✓	7
Tennessee	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Texas	✓	✓	✓	✓	✓		✓	✓	✓		8
Utah	✓	✓	✓	✓		✓	✓	✓	✓	✓	9
Vermont	✓	✓	✓	✓	✓		✓	✓	✓	✓	9
Virginia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10
Washington	✓	✓	✓	✓	✓		✓			✓	7
West Virginia		✓	✓		✓	✓	✓	✓	✓	✓	8
Wisconsin		✓	✓	✓	✓		✓		✓		6
Wyoming		✓	✓	✓			✓		✓	✓	6
Totals	37+DC	43+DC	43	48	38+DC	29+DC	50+DC	37+DC	39+DC	44+DC	

Some indicators reflect states' use of funds received through bioterrorism and public health "cooperative agreement" grants from the U.S. Centers for Disease Control and Prevention (CDC) and the Office of the Assistant Secretary for Preparedness and Response (ASPR) at the U.S. Department of Health and Human Services (HHS), other health capacity readiness programs, and state public health funds for health emergency preparedness. (For more information see Appendix A: CDC and ASPR Preparedness Grants by State and Indicator 10 for state public health budget information.) Other indicators, however, illustrate the breadth of all-hazards public health preparedness and examine state laws and state collaboration with planning partners.

Data from these indicators were drawn from a range of publicly available sources, including CDC, a survey conducted by the Association of Public Health Laboratories (APHL), public announcements from states, and interviews with government officials.

Indicators	What the Indicators Measure
1. Mass Distribution -- Strategic National Stockpile -- Does the state have an adequate plan to distribute emergency vaccines, antidotes, and medical supplies from the Strategic National Stockpile (SNS)?	This indicator assesses a state's emergency response plan to quickly provide medications to communities during emergencies.
2. Mass Distribution -- Antiviral Stockpiling -- Did the state purchase a portion of its share of federally subsidized or unsubsidized antiviral drugs to stockpile for use during an influenza pandemic?	This indicator assesses the state's ability to provide antivirals to key personnel (healthcare workers, first responders) and high-risk populations during an influenza pandemic.
3. Public Health Laboratories -- Bio-Threat Testing -- Does the state lab director report having sufficient laboratory capabilities to test for biological threats?	This indicator demonstrates states' abilities to quickly identify a bioterror attack, substances that may be used in an attack, or a major infectious disease outbreak. Identification of an outbreak and individuals who have been exposed or are symptomatic drives decisions about treatment and containment. The need for bio-lab capabilities was evident during the anthrax attacks of 2001.
4. Public Health Laboratories -- Workforce Surge Preparedness -- If needed in an emergency, does the state public health laboratory have the capability to provide 24/7 coverage to analyze samples?	This indicator reflects whether states have planned for workforce surge capacity in the event of a bioterrorist attack or pandemic influenza outbreak.
5. Biosurveillance -- Does the state use a disease surveillance system that is compatible with CDC's national system, including integrating data from multiple sources, using electronic lab reporting, and using an Internet browser?	This indicator demonstrates information about which states track health threats in a manner compatible with the standards of CDC's National Electronic Disease Surveillance System (NEDSS). This system makes it possible to quickly identify and track outbreaks and share the information in a consistent way across health agencies and states.
6. Healthcare Volunteer Liability Protection -- Does the state have laws that reduce or limit the liability exposure for healthcare volunteers who serve in a public health emergency?	This indicator helps evaluate states' abilities to call up a healthcare volunteer workforce in the event of a public health emergency. The lack of liability protection is a serious deterrent to many volunteers who may want to offer their healthcare services but are fearful of doing so without clear liability laws.
7. Emergency Preparedness Drills -- Does the state health department engage the state National Guard in public health emergency preparedness drills or training exercises?	All state pandemic preparedness plans envision a role for the National Guard in the event of an outbreak. This indicator illustrates whether states have exercised this portion of their plans.
8. Community Resiliency -- Does the state meet a minimum threshold of Medical Reserve Corps volunteers per 100,000 persons?	This indicator demonstrates states' preparedness in 2 main ways. First, volunteers have to meet certain federally defined criteria to be formally designated at MRC members. Second, MRC designation suggests the importance of building and sustaining an infrastructure for citizen involvement.
9. Public Health Progress -- Seniors' Seasonal Flu Vaccination -- Did the state increase its rates for immunizing adults aged 65 and older for the seasonal flu?	Immunizing seniors against the seasonal flu is a public health priority, since seniors are at a high risk for developing serious health complications as a result of contracting the flu. Seasonal flu vaccination efforts are also viewed as a way to help communities better prepare for larger public health emergencies, such as a pandemic flu outbreak, that would require mass or targeted vaccinations or distribution of medications. This indicator helps measure both public health concerns. It examines a state's progress over time.
10. Funding Commitment -- Did the state maintain or increase funding for public health programs for FY 2005-06 to FY 2006-07?	This indicator, adjusted for inflation, demonstrates states' commitment to funding public health programs, which support the infrastructure needed to adequately respond to emergencies.

INADEQUATE TRANSPARENCY AND ACCOUNTABILITY FOR PUBLIC HEALTH PREPAREDNESS

For the past 5 years, TFAH has issued *Ready or Not?* reports. Although these reports also contained 10 indicators for state public health emergency preparedness, they are not the same indicators from year to year. Indicators are adapted annually to reflect changing expectations for preparedness and changes in the state preparedness data that are made publicly available annually.

TFAH has repeatedly called for greater availability of data from both federal and state governments to better inform the American people about how prepared the country and their states and local communities are to meet health threats and hold public officials accountable.

Although the federal government has set broad goals and objectives for homeland security, including public health emergency preparedness, it has yet to develop specific, outcome-oriented goals and objectives by which to measure preparedness. Instead, the Centers for Disease Control and Prevention (CDC) rely on 6 performance measures that it collects and disseminates on an aggregate basis, without sharing state-specific data. These measures are heavily focused on process-oriented objectives and not on outcome-oriented objectives. For example, one of the performance measures evaluates the "time to complete a draft of an After-Action Report/Improvement Plan."[16] Although it is important to have timely evaluations of drills and exercises, a more useful, outcome-oriented performance measure would be to evaluate how well the state health department performed on certain tasks during the drill, for example "number of patients screened and vaccinated for seasonal influenza during a drive-through vaccination clinic."

CDC has said that it is developing, in coordination with research organizations and universities, a series of new performance measures that it plans to roll out in 2009. These new measures will incorporate more drills and exercises to ensure that states' "paper plans" actually can deliver in a public health emergency.

In the absence of government-supported and publicly available data, the report concentrates on 10 measurable performance indicators from a variety of public sources to help supply policymakers and the public with information about the nation's preparedness for health emergencies.

Indicator 1: MASS DISTRIBUTION -- STRATEGIC NATIONAL STOCKPILE

FINDING: Thirteeen states do not have adequate plans to distribute emergency vaccines, antidotes, and medical supplies from the Strategic National Stockpile (SNS).

37 states and D.C. scored 60 and above on CDC's new SNS evaluation tool OR previously achieved a "green" or "green minus" status on the old SNS rating scale for delivery and administration capabilities (1 point)			**13 states scored below 60 on CDC's new SNS evaluation tool OR previously failed to achieve a "green" or "green minus" status on the old SNS rating scale for delivery and administration capabilities (0 points)**	
Alabama*	Kansas	New York	Arkansas	North Dakota
Alaska	Kentucky*	Ohio	Georgia	South Carolina
Arizona	Louisiana	Oklahoma	Hawaii^	South Dakota^
California	Massachusetts	Oregon	Maine	West Virginia
Colorado	Michigan	Pennsylvania	Maryland^	Wisconsin
Connecticut	Minnesota	Rhode Island	North Carolina+	Wyoming
Delaware	Mississippi	Tennessee		
D.C.	Missouri	Texas		
Florida	Montana	Utah		
Idaho	Nebraska	Vermont		
Illinois	New Hampshire	Virginia		
Indiana	New Jersey	Washington*		
Iowa	New Mexico			

*Sources: Public records and State Health Officials * State scored green + or -- under old SNS evaluation system. ^ State was recently evaluated but its score was unavailable as of November 30, 2007 AND the state did not score green + or -- under the old evaluation system. + State will be evaluated in January 2008*

The Strategic National Stockpile (SNS) is a national repository of antibiotics, chemical antidotes, antiviral drugs, antitoxins, life-support medications, intravenous (IV) administration, airway maintenance supplies, and medical and surgical items. The SNS is designed to supplement and re-supply state and local public health agencies in the event of a national emergency anywhere and at anytime within the United States or its territories. As a condition of federal public health preparedness grants, states were required to develop a plan and then exercise the receipt and distribution of SNS contents.[17]

Until September 2006, CDC measured states' preparedness to distribute SNS materiel using a "stop-light" color system, for which green represented the highest level of preparedness, amber the middle, and red the lowest.[18] CDC never released specific criteria for achieving different SNS color status levels.

Beginning in September 2006, HHS/ASPR commissioned RAND to develop a new system to measure states' SNS distribution preparedness plans based on a 0-to-100 scale. The evaluation relies primarily on a checklist tool for evaluating SNS plans and supporting documents. The evaluation takes place over the course of one day during an on-site CDC staff visit.[19] There are 13 functions on which states are evaluated:[20]

1. Developing a stockpile plan;
2. Management of stockpile;
3. Requesting stockpile;
4. Tactical communication;
5. Public information and communication;
6. Security;
7. Receipt, storage, and staging of stockpile;
8. Controlling stockpile inventory;
9. Repackaging stockpile medications;
10. Distribution of medications;
11. Dispensing prophylaxis;
12. Treatment center coordination; and
13. Training-exercise and evaluation.

Items on the checklist are combined into an overall score that results in jurisdictions being rated on a 0-to-100 scale.[21] **CDC has not released the specific grading criteria it uses for awarding points nor has it given the public any basis for interpreting these new scores. In the absence of both, TFAH set a threshold of 60 out of 100 points and awarded states that scored 60 or higher a point.**

The new scoring system assesses **planning and management of the stockpile**. It does ***not*** reflect the actual capacity of the state to deploy countermeasures and other supplies from the SNS.

CDC officials report that, as of November 20, 2007, 48 states and all 4 separately funded cities have undergone the one day evaluation using the new 100-point scale.[22] Given that not all 50 states had the opportunity to be evaluated under the new 100-point system by the time the *Ready or Not?* 2007 report went to press, states that previously achieved 'green' or 'green minus' status under the old stop-light system also received a point for this indicator.

TFAH reviewed public announcements issued by states and, with the assistance of the Association of State and Territorial Health Officials (ASTHO), queried state health officials to determine the SNS status of states.

Distribution of States' Strategic National Stockpile Technical Assistance Review Scores

≥90	15
80 to 89	12
70 to 79	0
60 to 69	8
≤59	3

Note: According to CDC, a total of 48 states and 4 major U.S. cities, including, D.C., were evaluated under the new SNS TAR as of November 2007. However, only 40 states and D.C. reported this to TFAH. The tallies above represent the distribution of scores for the 37 states and D.C. reviewed under the new SNS TAR who provided that information to TFAH. Three other states confirmed to TFAH that they recently had been evaluated but did not yet have their scores.

THE STRATEGIC NATIONAL STOCKPILE (SNS)

The SNS is positioned in undisclosed locations throughout the United States and configured to provide a flexible response strategy. Included in the formulary are a dozen 12-hour Push Packages which contain over 50 tons of broad spectrum antibiotics and medical materiel. These assets are pre-configured in deployable containers and strategically located to enable rapid delivery to the site of a national emergency within 12 hours of the federal decision to deploy.

The majority of the SNS formulary is maintained in managed inventory. Like the 12-hour Push Packages, these assets are also strategically located around the nation and provide the ability to configure and deliver significant quantities of pharmaceuticals and medical materiel as an initial response if the nature of the public health emergency is well defined, or as follow-on to a "push package" delivery. Delivery of assets from managed inventory are planned to begin arriving within 24 to 36 hours after the federal decision to deploy them. Quantities in the SNS change based on national planning guidance and prioritization, modeling scenarios, and standard inventory management procedures. Some of the contents of the national stockpile include:[23]

- Enough smallpox vaccine to protect 300 million people, or every man, woman, and child in America;
- Over 41 million regimens of countermeasures against anthrax;
- Therapeutic anthrax antitoxins to treat symptomatic patients;
- Countermeasures to address radiation exposure including over 460,000 combined doses of Calcium-DTPA (Diethylenetriamine pentaacetate) and Zinc-DTPA; and
- 1.7 million doses of liquid potassium iodide (KI) in a formulation that is more suitable for young children for use in the event of a release of radioiodines.

The SNS also has been increasing its supply of countermeasures that could be used during an influenza pandemic. For example, the Department of Health and Human Services has allocated a total of $1.1 billion for the purchase of antiviral medications, $660 million of which have been obligated as of May 2007. Overall, as of September 20, 2007, the SNS contained the following pandemic flu countermeasures:[24]

- 30.8 million regimens of Oseltamivir capsules;
- 6.2 million regimens of Zanamivir;
- 104.4 million N95 respirators; and
- 51.5 million surgical masks.

To help states develop their own antiviral drug stockpiles, HHS designated $170 million to subsidize the purchase of up to 31 million treatment courses of Tamiflu (oseltamivir) and Relenza (zanamivir) by CDC Public Health Emergency Preparedness (PHEP) cooperative agreement grantees. HHS will subsidize 25 percent of the cost, and grantees will pay the other 75 percent. Forty-three states and D.C. have made a good faith effort to purchase some, if not all, of their allotment of federally-subsidized antivirals. Eighteen states have purchased their entire allocation, while 15 states purchased unsubsidized treatment courses.

SNS and Children

There are currently only 6,000 regimens of pediatric antiviral suspension in the Strategic National Stockpile (SNS) to treat a potential pandemic flu for the nation's 73.6 million children.[25] For planning purposes the federal government has assumed that antivirals would be needed for at least 25 percent of the population. However, they have not set any target for stockpiling pediatric antivirals **even though children and adolescents are known to often be disproportionately affected by contagious respiratory illnesses.** (See also Section 5 of this report regarding the care and special needs of children during a pandemic.)

Government Oversight

An October 2007 Government Accountability Office (GAO) report identified a major issue of concern with regard to anthrax vaccines in the SNS. According to the report, beginning in 2008, several lots of BioThrax will begin to expire. Annual replacement costs of the anthrax vaccine are estimated at $100 million per year in lost stockpile. Keith Rhodes, lead author of the GAO report, testified before Congress that "ASPR lacks an effective strategy to minimize waste. Vaccine valued at more than $12 million has already expired and is no longer usable. Without an effective management strategy in the future, over $100 million per year could be lost for the life of the licensed anthrax vaccine currently in the stockpile."[26]

One remedy would be to collaborate with the Department of Defense (DOD), which routinely inoculates troops against anthrax. According to the GAO, DOD could use SNS stockpiled anthrax vaccine before it expires. DOD would replace what it uses with new purchases of vaccine. DOD demand for vaccine would keep the stockpile from expiring as good vaccines would be distributed each year to new recruits while fresh stock would enter into the SNS.[27] HHS and DOD have been discussing this type of collaboration and expect to reach an agreement in the near future.

Other Concerns

- The 460,000 combined doses of Calcium-DTPA (Diethylenetriamine pentaacetate) and Zinc-DTPA are far short of what would be needed to address radiation exposure from a catastrophic nuclear event in any large U.S. city;
- The 1.7 million doses of liquid potassium iodide (KI) in a formulation suitable for young children are stored in 12 disparate locations around the country. If there were any sort of radiological attack, parents and caretakers would need to administer this countermeasure to children in a matter of hours. Will the government be able to mobilize the SNS in enough time to reach the affected children? ; and
- The quantity of non-pharmaceutical interventions for pandemic influenza, such as N95 respirators and surgical masks, falls far short of what is needed. The U.S. stockpile contains 104.4 million N95 respirators and 51.5 million surgical masks, while France, with a population one-fifth that of the U.S., has stockpiled 300 million N95s and one billion surgical masks.[28]

WHY PREPAREDNESS PLANS AREN'T ENOUGH

"Exercises and drills test the ability of jurisdictions to execute their plans, and they detect planning gaps. Consequently, assessments of response capability rest not only on assessments of planning, but also on assessments of exercise programs and integration of findings into subsequent rounds of planning," Congressional Research Service.[29]

There are 3 key reasons to measure public health emergency preparedness:

1. Performance measures allow planners and policy makers to focus on the most critical aspects of emergency planning;
2. Performance measures hold officials accountable to the public; and
3. Well-designed performance measures allow evaluators to identify and address deficiencies.[30]

Often, emergency plans are evaluated using written assessments that include surveys, checklists, and written reports. According to Christopher Nelson, senior scientist at RAND, written evaluations can not assess how well volunteers and public health officials would implement plans. "The distinguishing characteristic of written assessments is that they rely mostly on self-reported judgments of those being assessed."[31] Written assessments are favored by many preparedness officials because they tend to be inexpensive, especially when compared to the cost of holding live exercises or drills. A growing number of experts, however, both within and outside of government, are urging federal, state, and local emergency planners to incorporate drills and real-time exercises into their preparedness training and evaluation. RAND is one of the research organizations working on developing new, drill-based performance measures in collaboration with HHS and CDC.

The PAHPA legislation ties state and local preparedness funding to states' incorporation of drills and exercises to test emergency preparedness. While many public health experts applaud this, they caution that simply holding an exercise or drill does not mean the state or local government would be able to respond adequately in a real emergency situation. One major flaw with the current drilling system is a lack of clear criteria for evaluating the quality of performance. At present, there are no evidence-based guidelines from the federal government regarding conduct of an emergency preparedness exercise in terms of what outcomes are expected from each drill.

Until such guidance is developed, one way state and local planners can incorporate more drills into their preparedness evaluations is to use so-called embedded assessments. This type of exercise makes use of ongoing public health activities, such as an annual flu clinic, to measure a state's or locality's ability to vaccinate populations against smallpox or influenza. Planners can use the results of this embedded assessment to determine where bottlenecks occur or whether other barriers to a successful deployment of vaccine exist.

Embedded Assessments

Lyon County, Kansas: The Flint Hills Community Health Department in Lyon County, Kansas conducted a 9-hour pandemic flu exercise on October 11, 2007.[32] The exercise offered a seasonal flu shot for $15 to anyone in the community who wanted one and gave healthcare workers, law enforcement, government officials, and other volunteers the practice they need to prepare for a pandemic influenza or other infectious disease outbreaks. In the first hour alone, 313 people completed a background information form for screening before being directed to one of the flu shot stations located in the building. The high volume of patients seeking treatment was a good experience for planners who might need to treat a significantly higher amount of patients in a pandemic. By the end of the day, 1,584 people had been screened and vaccinated.

Indicator 2: MASS DISTRIBUTION -- STATE ANTIVIRAL PURCHASES

FINDING: Forty-three states and D.C. have purchased antivirals to stockpile for use during an influenza pandemic.

43 states and D.C. have purchased a portion of their shares of federally-subsidized or unsubsidized antiviral drugs to stockpile for use during aninfluenza pandemic (1 point)			7 states have NOT purchased any portion of their shares of federally-subsidized or unsubsidized antiviral drugs to stockpile for use during an influenza pandemic (0 points)		
State	**All Antivirals Purchased by Entity as of 11/13/07**	**Percent of Allocation Purchased****	**State**	**All Antivirals Purchased by Entity as of 11/13/07**	**Percent of Allocation Purchased ****
Alabama	499,967	106%	Colorado	0	0%
Alaska	39,740	58%	Connecticut	0	0%
Arizona	67,717	12%	Florida	0	0%
Arkansas	286,398	100%	Massachusetts	0	0%
California*	2,722,481	101%	Mississippi	0	0%
Delaware	121,164	141%	North Dakota	0	0%
D.C.	45,000	77%	Rhode Island	0	0%
Georgia	474,022	52%			
Hawaii	172,487	132%			
Idaho	8,567	6%			
Illinois*	512,228	50%			
Indiana	650,912	100%			
Iowa	308,887	100%			
Kansas	286,084	100%			
Kentucky	216,224	50%			
Louisiana	471,804	100%			
Maine	137,457	100%			
Maryland	210,727	36%			
Michigan	1,076,950	102%			
Minnesota	117,287	22%			
Missouri	600,477	100%			
Montana	8,174	8%			
Nebraska	70,102	38%			
Nevada	135,514	58%			
New Hampshire	135,305	100%			
New Jersey	831,600	92%			
New Mexico	68,930	35%			
New York*	1,277,889	109%			
North Carolina	560,380	63%			
Ohio	1,277,770	106%			
Oklahoma	49,390	13%			
Oregon	13,300	4%			
Pennsylvania	974,081	75%			
South Carolina	349,499	80%			
South Dakota	80,310	100%			
Tennessee	47,124	8%			
Texas	906,140	39%			
Utah	50,668	21%			
Vermont	52,021	80%			
Virginia	816,312	106%			
Washington	293,073	46%			
West Virginia	110,095	58%			
Wisconsin	152,979	27%			
Wyoming	52,718	100%			

*Source: Office of the Assistant Secretary for Preparedness and Response. *Note: State purchases do not include antivirals purchased by Los Angeles County, Chicago, and New York City. These 3 entities received their own allocation of federally-subsidized antivirals based on their population. See Appendix B: Influenza Antiviral Drug Purchases by States and Entities for a complete breakdown of state and entity purchases. **Note: The percent reflects total state antiviral purchases and may include unsubsidized state purchases, which is why some states exceed 100% of their federally-subsidized allocation.*

The U.S. government's current goal is to stockpile 81 million treatment courses of antiviral drugs. The Bush Administration has stated that this goal will be a shared responsibility among the federal and state governments. A major concern of top federal officials, however, including HHS Secretary Michael Leavitt is that states are not meeting their obligations. "I worry about local and state governments and private entities relying on the federal government instead of preparing themselves. Our national stockpiles are set up to cover gaps, not to provide everything for everybody."[33]

In order to encourage states to develop their own antiviral drug stockpiles, HHS designated $170 million to subsidize the purchase of up to 31 million treatment courses of Tamiflu (oseltamivir) and Relenza (zanamivir) by CDC Public Health Emergency Preparedness (PHEP) cooperative agreement grantees. HHS will subsidize 25 percent of the cost, and states will pay the other 75 percent, or a combined total of $680 million.[34]

Forty-three states and D.C. have made a good faith effort to purchase some, if not all, of their allotment of federally-subsidized antivirals. Eighteen states purchased their entire allocation, while 15 states purchased unsubsidized treatment courses. The 7 states that failed to purchase any antivirals are: Colorado, Connecticut, Florida, Massachusetts, Mississippi, North Dakota, and Rhode Island.

In addition to the 50 states and D.C., 3 U.S. metropolitan areas, the U.S. Territories, and the Freely Associated States of the Pacific were allocated a portion of federally-subsidized antivirals. Of these entities, Los Angeles County and Puerto Rico purchased their entire allotment, while Chicago purchased close to two-thirds of its allotment. **(See Appendix B: Influenza Antiviral Drug Purchases by States and Entities for a complete breakdown of state and entity purchases.)**

While public health emergency preparedness is largely regarded as a partnership among the federal government and the states and local governments, there are serious concerns associated with sharing the burden of antiviral stockpiling.

First, not all states have the fiscal resources to purchase their share of antivirals. Second, some elected state officials have determined that antiviral stockpiling is not a priority. Finally, state officials have indicated that better inventory management, including the storage, rotation, and shelf-life extension strategies, are of critical concern to them.[36] All 3 of these barriers are likely to lead to geographic inequities in terms of antiviral treatment during a pandemic.

In addition, HHS is preparing a draft of new recommendations on antiviral stockpiling. Instead of aiming to stockpile enough antivirals to treat 25 percent of the population, the new draft recommendations call for much broader use of antivirals. This includes the post-exposure prophylaxis treatment of household contacts of people who are infected with the pandemic influenza virus, as well as pre-exposure prophylaxis treatment of healthcare workers and other essential personnel likely to come into contact with infected persons.

Given the states' difficulties in meeting their commitments under the current guidelines, it is unlikely they will be able to meet future commitments. Containment of a pandemic must be a national priority. Any differences in capacity on a state-by-state basis place the entire nation at risk.

Indicator 3: PUBLIC HEALTH LABORATORIES -- BIO-THREAT TESTING

FINDING: Seven states and D.C. report that they do not have adequate bio-threat response laboratory capabilities (facilities, technology, and/or equipment).

43 states report that they do have adequate bio-safety level 3 (BSL-3) laboratories to meet anticipated preparedness and response needs as outlined in their state's emergency preparedness plan (1 point)		**7 states and D.C. report they do NOT have adequate bio-safety level 3 (BSL-3) laboratories to meet anticipated preparedness and response needs as outlined in their state's emergency preparedness plan (0 points)**
Alabama	Nebraska	D.C.
Alaska	Nevada	Idaho
Arizona	New Hampshire	Iowa
Arkansas	New Jersey	Kansas
California	New Mexico	Louisiana
Colorado	New York	Massachusetts
Connecticut	North Carolina	Oregon
Delaware	North Dakota	Rhode Island
Florida	Ohio	
Georgia	Oklahoma	
Hawaii	Pennsylvania	
Illinois	South Carolina	
Indiana	South Dakota	
Kentucky	Tennessee	
Maine	Texas	
Maryland	Utah	
Michigan	Vermont	
Minnesota	Virginia	
Mississippi	Washington	
Missouri	West Virginia	
Montana	Wisconsin	
	Wyoming	

Source: APHL November 2007 survey

Public health laboratories are responsible for identifying naturally occurring and man-made health threats. Their identification and diagnosis process is crucial for developing strategies to contain the spread of illness and facilitate the rapid treatment of diseases.

Forty-three states have adequate capacity to conduct laboratory tests during a public health emergency. Among the 43 states reporting adequate BSL-3 labs, 5 states improved their biological testing capabilities since 2006. The 5 states are Alaska, Colorado, Connecticut, Maryland, and Ohio.

Seven states and D.C. report they do not have sufficient capacity to conduct laboratory tests during a bioterrorism or infectious disease emergency. Among these respondents, 3 states reported having BSL-3 capabilities in the 2006 survey. Kansas, Massachusetts, and Oregon are the 3 states that experienced a downgrade in BSL-3 capacity. State public health lab directors cited renovations, decreasing laboratory space, and increasing test demand as the reasons for this change in status. Kansas is in the process of upgrading its BSL-3 suites, while Oregon will open a brand new lab in January 2008 with ample BSL-3 space. Massachusetts reassessed its BSL-3 facilities and determined that its current BSL-3 capacity is insufficient to manage the state's current needs, much less a large-scale outbreak.

Despite the reversal of 3 states, overall much progress has been made since 2003, when 44 states did not have sufficient bio-safety level 3 (BSL-3) capabilities.

Bioterrorism lab capacity includes having enough equipment and staff to safely handle "infectious agents that may cause serious or potentially lethal disease as a result of exposure" via inhalation.[36] Labs with this capacity are designated with a BSL-3 rating.

The nation's public health laboratories encompass a "loose network of federal, state, and local laboratories that work in undefined collaboration with private clinical laboratories."[37] The 2001 anthrax attacks demonstrated the need to upgrade and continue to maintain public health labs as they were quickly overwhelmed with samples from around the country. In many cases, they were left to conduct tests with inadequate equipment, facilities, and expert staff, leaving the nation more vulnerable and slower to respond. Response time would have been faster if lab capacity had been upgraded.[38]

LABORATORY RESPONSE NETWORK (LRN)

Instead of bolstering lab capacity in each state, a Laboratory Response Network (LRN) was established in 1999 to provide "surge capacity" support to states. Overseen by CDC, the LRN is an integrated network of approximately 160 labs encompassing federal, state, local, veterinary, military, environmental, food testing, and international labs.[39]

The LRN provides emergency assistance and support through the pooling of resources and personnel based on cooperative agreements. During the anthrax attacks of 2001, the nation's public health laboratories conducted over one million separate anthrax tests. Since then, public health laboratories have routinely tested samples to rule out bioterrorism in support of law enforcement and public health agencies. According to the Association of Public Health Laboratories, between August 31, 2005 and August 30, 2006, state public health laboratories received more than 2,300 undetermined samples for all-hazards screening in addition to some 2,400 samples to test for potential agents of biological terrorism.[40]

The LRN has also played an important role in disease surveillance including the development and deployment of a new test that can detect the H5N1 avian flu virus. The new test received FDA approval in February 2006 and has been distributed to LRN labs nationwide.[41]

FEDERAL FUNDING FOR STATE AND LOCAL LABS

The CDC budget for FY 2007 included $27 million for upgrading state and local public health laboratory capacity. The funds were used to:

- Respond rapidly and effectively to a terrorist event or public health emergency;
- Purchase new instrumentation, adopt new technologies and develop electronic reporting;
- Recruit and retain laboratory personnel;
- Maintain outreach programs to hospital and clinical laboratories and first responders; and
- Assure a coordinated response effort with federal partners.

The president's FY 2008 budget request for state and local public health laboratory upgrades remained at $27 million, while the Association of Public Health Laboratories (APHL) said it would need $47 million in order to preserve state and local capacity constructed in recent years.[42]

In addition, APHL identifies several areas where more funding is needed, including:

- Expanded chemical terrorism detection;
- Funds for reagents, the diagnostic materials that are required to analyze suspect samples for biological agents; and
- Funding to improve public health laboratory capability to investigate or confirm radiation sickness or genetic mutations.

PUBLIC HEALTH LABS -- CHEMICAL TESTING

In light of threats posed by terrorist use of chemical agents, the LRN expanded in 2003 its scope of work to include preparedness for acts of chemical terrorism. The chemical LRN is made up of 62 state, territorial, and metropolitan public health laboratories. Only 10 of these labs, however, are characterized as Level 1 laboratories within the chemical LRN.[43] These 10 Level 1 labs are equipped to detect an expanded number of chemical agents in human specimens (blood, saliva, urine), plus run analyses for mustard agents, nerve agents, and other toxic chemicals that could be used in chemical warfare, a process known as '*biomonitoring.*'

Of these 10, half are 'new' labs that need to be brought "to analytical parity with existing Level 1 laboratories," a process that is expected to take 3 years.[44] The 5 existing Level 1 labs are in California, Michigan, New Mexico, New York, and Virginia. The 5 new Level 1 labs will be located in: Florida, Massachusetts, Minnesota, South Carolina, and Wisconsin.[45] The total number of labs capable of biomonitoring activities has remained unchanged since 2005.

In the event of a chemical terrorist attack, labs will not only need to be able to test clinical specimens, but also environmental samples, such as water, air, soil, or food, to determine the source, route, and potential extent of contamination. Very few public health laboratories, however, are able to test for chemical warfare agents in environmental samples. In 2006, the Environmental Protection Agency (EPA) began developing the environmental arm of the LRN (eLRN) which will include equipment standards, testing protocols, and training modules for laboratory workers. Without adequate funding, however, it is unclear how many states will be able to upgrade their public health labs.

According to CDC, there are over 80 chemical agents that can kill or seriously injure a person.[46] Of these, 60 or so are toxic substances that could be used as chemical weapons by terrorists. Many of these are common commercial and industrial chemicals that can be easily weaponized.

Indicator 4: PUBLIC HEALTH LABORATORIES -- SURGE PREPAREDNESS

FINDING: Only 2 states and D.C. report that their public health laboratories do not have the capability to provide 24/7 coverage to analyze samples.

48 states report that their public health laboratories have the capability to provide 24/7 coverage to analyze samples (1 point)		2 states and D.C. report that their public health laboratories do NOT have the capability to provide 24/7 coverage to analyze samples (0 points)
Alabama	Montana	D.C.
Alaska	Nebraska	Kansas
Arizona	Nevada	West Virginia
Arkansas	New Hampshire	
California	New Jersey	
Colorado	New Mexico	
Connecticut	New York	
Delaware	North Carolina	
Florida	North Dakota	
Georgia	Ohio	
Hawaii	Oklahoma	
Idaho	Oregon	
Illinois	Pennsylvania	
Indiana	Rhode Island	
Iowa	South Carolina	
Kentucky	South Dakota	
Louisiana	Tennessee	
Maine	Texas	
Maryland	Utah	
Massachusetts	Vermont	
Michigan	Virginia	
Minnesota	Washington	
Mississippi	Wisconsin	
Missouri	Wyoming	

Source: APHL November 2007 survey

Bioterrorism lab capacity includes having the capability to call on staff 24 hours a day, 7 days a week to analyze samples from bioterrorist attacks, natural disasters, or disease outbreaks that do not necessarily occur during the 9 to 5, Monday through Friday workday schedule.

Forty-eight states have the capability to provide 24/7 coverage to analyze samples. Two states and D.C. do not have this capability and cite the lack of additional trained personnel as a major limiting factor to providing 24/7 coverage.

Indicator 5: BIOSURVEILLANCE

FINDING: Twelve states do not have an electronic disease surveillance system that includes an integrated data repository, electronic lab reporting, and Internet-browser system that is compatible with CDC's system.

38 states and D.C. report that they use a disease surveillance system that is compatible with CDC's National Electronic Disease Surveillance System (NEDSS) (1 point)		12 states report that they do NOT use a disease surveillance system that is compatible with CDC's National Electronic Disease Surveillance System (NEDSS) (0 points)
Alabama	New Jersey	Alaska
Colorado	New Mexico	Arizona
Delaware	New York	Arkansas
D.C.	North Carolina	California
Florida	North Dakota	Connecticut
Georgia	Ohio	Iowa
Hawaii	Oklahoma	Kansas
Idaho	Oregon	Minnesota
Illinois	Pennsylvania	Mississippi
Indiana	Rhode Island	New Hampshire
Kentucky	South Carolina	Utah
Louisiana	South Dakota	Wyoming
Maine	Tennessee	
Maryland	Texas	
Massachusetts	Vermont	
Michigan	Virginia	
Missouri	Washington	
Montana	West Virginia	
Nebraska	Wisconsin	
Nevada		

Source: CDC, ASTHO, and State Health Officials

Delivering effective public health services depends on timely and reliable information. Health departments can not protect people from existing or emerging health threats, such as a new disease outbreak, like a pandemic flu, or a bioterrorist attack, without correct and pertinent information. The lack of timely and comprehensive data can delay the identification of and response to serious and mass emergency health problems. In addition, federal, state, and local health departments and private healthcare providers must all work together to effectively track information about and respond to health threats.

The National Electronic Disease Surveillance System (NEDSS) was developed to integrate and standardize the tracking of infectious diseases. It promotes standards-based, electronic reporting for more rapid, accurate, and integrated information. It is one of 4 components of the overarching Public Health Information Network (PHIN) at CDC, which includes:

- Disease data entry directly through an Internet browser-based system, thereby creating a database accessible by health investigators and public health professionals;
- Electronic Laboratory Results (ELR) reporting, which allows labs to report cases to health departments;
- Integration of multiple health information databases creating a single repository; and
- Electronic messaging capabilities, allowing states to share information efficiently with CDC and other health agencies.

According to CDC, to be considered NEDSS-compatible, states must have systems that meet requirements for 1) an Internet browser-based system; 2) electronic laboratory results (ELR) reporting; and 3) an integrated data repository. An upgrade to the messaging component is under development system-wide, and is, therefore, not included among the criteria.

In order to determine FY 2008 grant allocations, CDC's Division of Integrated Surveillance Systems and Services queried State Health Departments on the status of their Public Health Information Networks. According to CDC's 2007 Assessment of States NEDSS Status, 38 states and D.C. are NEDSS-compatible. Twelve states are identified as non-compatible with NEDSS. The majority of the non-compatible states meet 2 of the 3 criteria. These states are making steady progress towards meeting the third requirement.

The number of NEDSS-compatible states has increased steadily since 2004 when only 18 states earned this qualification. The number rose to 27 in 2005 to 38 in 2006 and 38 states plus D.C. in 2007. The District of Columbia, Indiana, North Carolina, West Virginia and Wisconsin became NEDSS-compatible in 2007, however, CDC downgraded Arizona, Kansas, New Hampshire, and Wyoming. In the case of Arizona, while the state is already testing receipt of ELR data from national labs and has made significant progress toward implementing ELR, it remains a component of their system architecture that is not yet completed, although it seems likely that this will be operational in 2008. Kansas halted ELR from the state lab for several months to allow for a system upgrade, while New Hampshire experienced difficulties with its IT contractor. In Wyoming, staffing challenges have delayed ELR implementation.

While the FY 2008 CDC preparedness guidance does not require NEDSS compatibility, NEDSS provides a basis for national consistency and compatibility and is the predominant system used by CDC. **It is currently one of the few data points about state preparedness activities that is collected and made publicly available by CDC.**

PUBLIC HEALTH DISEASE TRACKING AND SURVEILLANCE

The **Public Health Information Network (PHIN)** is a CDC initiative to ensure all public health jurisdictions -- federal, state, and local -- have access to information technology (IT) systems that can communicate and share data with one another. The 2001 anthrax attacks illustrated the necessity for IT systems to be consistent and interconnected across the country in order to accurately and rapidly communicate information among health departments. PHIN provides the underlying technology needed to create fully integrated IT systems across the public health infrastructure.

PHIN technology enables the U.S. public health system to:

- Perform early event detection;
- Execute routine public health surveillance and outbreak management;
- Connect laboratory systems;
- Track countermeasures and response administration; and
- Issue partner communications and health alerts.[47]

The **National Electronic Disease Surveillance System (NEDSS)** is the PHIN component responsible for routine public health surveillance. This CDC-led initiative "promotes the use of data and information system standards to advance the development of efficient, integrated, and interoperable surveillance systems at federal, state and local levels."[48] The main objective behind NEDSS is to streamline data collection and analysis of information that is already available electronically. By doing so, NEDSS aims to:

- Monitor and assess disease trends;
- Guide prevention and intervention programs;
- Inform public health policy;
- Identify issues needing public health research;
- Provide information for community and program planning; and
- Protect confidentiality while providing information to those who need to know.

NEDSS is due to replace several existing electronic disease surveillance systems including the National Electronic Telecommunications Survey for Surveillance, the HIV/AIDS reporting system, and others. By offering the NEDSS platform, CDC has encouraged local and state health departments to switch from paper-based case reporting to electronic case reporting.

While NEDSS is used to track case reporting and lab results, **BioSense** is the PHIN component used to perform early-event detection. BioSense collects information such as patients' symptoms, quantities and types of drug prescriptions, and the number of emergency room visits, among other data, from 350 of the nation's urban hospitals as well as veterans' hospitals and defense department facilities.[49] This type of surveillance, known as **syndromic surveillance**, relies on information available well before an official diagnosis or confirmed lab result. Early-event detection can be used to alert health officials to possible disease outbreaks or other emergency health problems such as bioterrorism.

The major strengths of syndromic surveillance systems, include:[50]

- The ability to detect community-wide seasonal outbreaks of influenza;
- Timeliness of data availability, often within 12 hours of initial activity;
- Completeness of data;
- Role in alleviating community concern when outbreaks are occurring elsewhere;
- Additional case finding when an outbreak has been identified; and
- Flexibility in being able to rapidly conduct surveillance for new and emerging issues.

Despite the promise of syndromic surveillance -- and some success at local health departments -- many public health officials say BioSense has failed to deliver on its promises. Three years into its development and some $230 million later, BioSense still "lacks real-time capability and has issued a stream of false alarms that would be comical were the stakes not so high."[51]

A third PHIN component is the **Health Alert Network (HAN)**, which provides CDC with the ability to alert state and local public health agencies and other partners about potential or real public health events. All 50 states and D.C. are connected to HAN.[53] According to CDC, the partner communication and alerting systems in state and local health departments are developed to the extent that CDC no longer measures the percent of counties and jurisdictions that have an internet connection.

Indicator 6: HEALTHCARE VOLUNTEER LIABILITY PROTECTION

FINDING: Twenty-one states do not have statutes that address one or both of 2 critical legal elements that extend liability to healthcare volunteers during emergencies.

29 states and D.C. have statutes that address one or both of 2 critical legal elements that extend liability to healthcare volunteers during emergencies (1 point)		**21 states do NOT have statutes that address one or both of 2 critical legal elements that extend liability to healthcare volunteers during emergencies (0 points)**	
Alabama	Minnesota*	Alaska	New Mexico
California	Missouri*	Arizona	North Dakota
Colorado*	Nebraska*	Arkansas	Ohio
Connecticut*	New Hampshire*	Delaware	Oklahoma
D.C.*	New Jersey*	Florida	Rhode Island
Georgia	New York*	Idaho	Texas
Hawaii	North Carolina*	Maryland	Vermont
Illinois	Oregon*	Massachusetts	Washington
Indiana	Pennsylvania	Mississippi	Wisconsin
Iowa*	South Carolina*	Montana	Wyoming
Kansas*	South Dakota	Nevada	
Kentucky*	Tennessee*		
Louisiana	Utah		
Maine*	Virginia		
Michigan*	West Virginia		

**Indicates that the state maintained statutes that meet both key criteria.*

All 50 states and D.C. have some form of a "Good Samaritan" statute contained in their laws. These state laws create liability shields for "Good Samaritans," that is, health care professionals or other individuals who come to the aid of another at the scene of an emergency.

There are some major limitations, however, to existing Good Samaritan laws. They often only provide liability for *emergency assistance* rendered at the scene of an emergency. As a result, once assistance passes beyond the immediate emergency stage or the scene of assistance moves outside an emergency location, the shield may end. This narrow scope presents a major challenge to public health emergency response planners who often need to rely on volunteers for extended periods of time, such that the help may be rendered hours, days and even weeks after the initial emergency, and often in a different location from the scene of the incident. Hurricane Katrina, which displaced hundreds of thousands of people from the Gulf Coast region to cities across the country, is an example for which healthcare volunteers treated patients away from the scene of the public health emergency and long after the hurricane came ashore on August 29, 2005.

The threat of liability may keep many potential healthcare volunteers from deploying in the event of an emergency. Given that all state and local preparedness plans rely on volunteers to help treat patients and distribute vaccines and medicines, among other things, failure to address the liability issue could severely affect a state's disaster response.

In view of the limitations of the Good Samaritan doctrine, this indicator focuses on 2 critical elements that serve to separate state statutes from longstanding Good Samaritan doctrine:

1. The existence of an authorized process to allow medical and other health professionals to become designated as voluntary health care workers acting under specific emergency response protocols; and
2. A shield that is tied to a declared emergency.

TFAH awarded one point to states whose statutes addressed either one or both of these elements. States that failed to address either in a sufficiently clear manner received 0 points.

Seventeen states and D.C., designated with an *, maintain statutes that meet both key criteria. That is, the laws in these states provide both for immunity of health care volunteers during emergencies and anticipate the establishment of a formal prospective designation process. An additional 12 states meet only one of the criteria. That is, these state laws allow for the extension of immunity for health care professionals during emergencies. However, nothing in these laws indicates the existence of a prospective designation system. Such a system would need to be specified in regulation or through an authoritative state ruling.

Twenty-one states provide no clear legal protections. That is because the states' statutory schemes either are silent on the issue of protections for voluntary health care workers during emergencies or are sufficiently ambiguous so that no such prospective immunity arrangement can be inferred in the absence of comprehensive implementing regulations or a ruling from an authoritative state official.

State laws extending prospective and comprehensive protections for health care volunteers during periods of declared emergencies vary significantly in statutory scope and clarity. Statutes also vary with respect to the scope of the immunity granted (i.e., covering all conduct or only conduct that is not grossly negligent, willful and wanton, or intentionally injurious).

For a more detailed write up of the review and the results, including the methodology, please refer to **Appendix C: Liability Issues for Healthcare Volunteers.** A web link to the chart *State by State Comparison Table – Healthcare Volunteer Liability Protection* also can be found in Appendix C.

UNIFORM EMERGENCY VOLUNTEER HEALTH PRACTITIONERS ACT

The Uniform Emergency Volunteer Health Practitioners Act (UEVHPA) addresses 3 issues of importance to healthcare volunteers who respond to a public health emergency:

- Licensing and accreditation;
- Liability protection; and
- Workers compensation.

Adopted by the National Conference of Commissioners on Uniform State Laws (NCCUSL) in 2006, the law "responds to a serious problem caused by lack of uniformity in state laws that was revealed during the horrific hurricane season of 2005."[53] Healthcare professionals from outside the affected Gulf Coast states who volunteered their services "were seriously delayed and, in some cases, prevented from providing services because they were unable to quickly and clearly obtain authorization to practice within the affected states."[54]

Although all 50 states have adopted the **Emergency Management Assistance Compact (EMAC)**, this only applies to state government employees and not private sector volunteers. In a large scale public health emergency, such as a natural disaster or a pandemic flu, response efforts will rely on both public and private sector volunteers. UEVHPA provides a simple, uniform method to get licenses recognized from one state to another and relies on established registration systems such as ESAR-VHP, Medical Reserve Corps, and the American Red Cross. UEVHPA also clarifies the scope of practice so that healthcare volunteers are only licensed to do what they already hold a license for in their home states.

EMERGENCY LEGAL PREPAREDNESS

In addition to liability protection for healthcare volunteers, there are 2 other areas where liability exposure should be limited in an emergency.

1. Liability protection **for non-healthcare volunteers**. For example, 17 states have legislation for good-faith immunity for architects or engineers who inspect infrastructure and buildings after a disaster.[55]

2. Liability protection for **entities and organizations** that deploy the non-health care volunteers in an emergency and/or provide facilities (such as a warehouse as a point of distribution) for use during an emergency. Iowa is the only state that has passed legislation that specifically offers immunity to organizations.[56]

The importance of liability protection for these 2 groups was underscored during tabletop exercises as part of the City Readiness Initiative. Planners realized that in order to dispense supplies from the SNS in 48 hours they would have to rely on public-private partnerships.

According to the Department of Homeland Security, however, these "public-private partnerships are vulnerable to risks and challenges which can lead to their termination or change of course. Some risks can be addressed; others can not. The risks may include: Concern by the private sector regarding potential liabilities associated with sharing information with governments, and for voluntary actions taken to assist in recovery from disasters. Many businesses would like to collaborate, but are deterred by real or perceived liability issues."[57]

Although the federal government provides immunity to vaccine manufacturers, if a private entity were to take part in any sort of influenza vaccine or antiviral distribution they might be liable were any adverse side effects to occur.

There are more mundane concerns, as well. For example, if a state power company were asked to participate in the distribution of supplies from the SNS and a power company employee slipped, fell and broke his leg in the process of the distribution, would the power company be liable? Would the state?

The American Red Cross (ARC), the largest volunteer organization in the country, has said that it will not deploy its volunteers in the event of a pandemic influenza outbreak for fears that it could be held liable if Red Cross volunteers contracted influenza while volunteering. The ARC will not "commit Red Cross workers to local public health overflow facilities without appropriate worker protections, including liability coverage and worker safety measures."[58]

Indicator 7: EMERGENCY PREPAREDNESS DRILLS

FINDING: Fifty states and D.C. held some sort of emergency preparedness drill or exercise in 2007 that involved both members of the State Health Department and the State National Guard.

50 states and D.C. held an emergency preparedness drill or exercise in 2007 with health department officials and the state National Guard (1 point)		0 states did NOT hold an emergency preparedness drill or exercise in 2007 with health department officials and the state National Guard (0 points)
Alabama	Montana	
Alaska	Nebraska	
Arizona	Nevada	
Arkansas	New Hampshire	
California	New Jersey	
Colorado	New Mexico	
Connecticut	New York	
D.C.	North Carolina	
Delaware	North Dakota	
Florida	Ohio	
Georgia	Oklahoma	
Hawaii	Oregon	
Idaho	Pennsylvania	
Illinois	Rhode Island	
Indiana	South Carolina	
Iowa	South Dakota	
Kansas	Tennessee	
Kentucky	Texas	
Louisiana	Utah	
Maine	Vermont	
Maryland	Virginia	
Massachusetts	Washington	
Michigan	West Virginia	
Minnesota	Wisconsin	
Mississippi	Wyoming	
Missouri		

Source: State Army and Air National Guard bureaus and State Health Officials

HHS guidance on emergency preparedness planning directs state and local governments to reach out to all sectors of the law enforcement community, including the National Guard.[60] All fifty states and D.C. have conducted some type of joint exercise involving members of the state health department and state National Guard.

Recent events have highlighted the daunting challenges associated with securing and defending citizens against the spectrum of diverse and uncertain threats domestically. The Department of Defense's responsibility for domestic defense has greatly expanded since the September 11, 2001 terrorist attacks. A number of sentinel national security documents released over the past few years have articulated an important and expanding role for the military and National Guard Units to assist civil responders in both mitigating the effects and managing the consequences of catastrophic events. In fact, National Guard units have been deployed to support a growing number of requests from civil authorities, such as those made during Hurricanes Katrina and Rita, during which 50,000 Guardsmen were deployed to support response efforts, and the wildfires in California. The role of Guardsmen during a

pandemic will be crucial, as evidenced by states' pandemic preparedness plans which discuss the role the National Guard will play in the event of a pandemic.

Federal and state laws and policies -- Title 10 (Federal Service under President) or Title 32 (State Service under Governor)-- regulate the missions of National Guard units based on their activated status. Given the growing challenges facing the National Guard in allocating its scarce resources between domestic and overseas missions, and the present ambiguity delineating civilian and military response roles, it is important to foster collaborative relationships and promote civil-military integration to facilitate collaborative response efforts, build surge capacity during emergency response, and ensure that National Guard units are organized, trained, and equipped to best meet their growing responsibilities in homeland defense and disaster preparedness to communities. (See **Appendix D: Emergency Preparedness Drills** for the methodology.)

EXAMPLES OF PANDEMIC AND ALL-HAZARDS PREPAREDNESS DRILLS

Arizona and California held a drill on July 24, 2007 to simulate how to efficiently meet the needs of survivors in the aftermath of a major earthquake.[60] Emergency planners believe that if a major quake were to hit California, many residents would self-evacuate from Los Angeles and San Diego along interstates into Arizona. The exercise, called "Golden Phoenix," brought together more than 50 military and civilian agencies who would be involved in disaster relief.

Butlerville, Indiana hosted the largest and most complex military and civilian disaster response drill of its kind in May 2007.[61] One of the scenarios over the 11-day exercise was centered on the detonation of a 10-ton nuclear bomb in downtown Indianapolis which killed 14,000 people and injured 21,000 people. Other scenarios included a simulated major hurricane and multiple terrorist attacks on military bases. The state exercise -- "Hoosier Sentry" -- brought together thousands of local, state, and national forces, including members of the National Guard and active-duty U.S. troops. The exercise focused on communication and resource management support of first responders. The state emergency operation center and mobile command center were tested as part of the exercise.

Cheyenne, Wyoming conducted a mass medication distribution drill in February 2007 to prepare for a public health emergency requiring the distribution of medication.[62] Representatives from every county worked under the scenario that the population of Cheyenne had to be treated within 48 hours. The drill allowed public health personnel to treat large numbers of patients. Responders also had the opportunity to practice with a radio system and videoconference technology. Department of Health Director Brent Sherard said he would rather be proactive than reactive. "It's a lot easier to get your ducks in a row before a disaster happens than after," he said. "A disaster of any proportion could happen anywhere at anytime. We all need to be prepared to protect the public."[63]

Indicator 8: COMMUNITY RESILIENCY

FINDING: Thirteen states do not meet the minimum threshold of 14 Medical Reserve Corps volunteers per 100,000 persons.

37 states and D.C. meet the minimum threshold of 14 Medical Reserve Corps volunteers per 100,000 persons (1 point)			13 states do NOT meet the minimum threshold of 14 Medical Reserve Corps volunteers per 100,000 persons (0 points)		
State	Total # of MRC Volunteers	MRC Volunteers per 100,000	State	Total # of MRC Volunteers	MRC Volunteers per 100,000
Alabama	3342	73	Arkansas	158	6
Alaska	330	49	Iowa	181	6
Arizona	2841	46	Louisiana	228	5
California	6562	18	Maine	42	3
Colorado	845	18	Michigan	618	6
Connecticut	5605	160	Mississippi	291	10
D.C.	874	150	Missouri	469	8
Delaware	214	25	Montana	79	8
Florida	3600	20	Nevada	243	10
Georgia	2437	26	South Dakota	0	0
Hawaii	452	35	Washington	753	12
Idaho	2643	180	Wisconsin	326	6
Ilinois	4160	32	Wyoming	68	13
Indiana	3991	63			
Kansas	581	21			
Kentucky	2539	60			
Maryland	6833	122			
Massachusetts	13948	217			
Minnesota	4496	87			
Nebraska	637	36			
New Hampshire	248	19			
New Jersey	4754	54			
New Mexico	449	23			
New York	11356	59			
North Carolina	1281	14			
North Dakota	2859	450			
Ohio	5961	52			
Oklahoma	3572	100			
Oregon	540	15			
Pennsylvania	1785	14			
Rhode Island	537	50			
South Carolina	687	16			
Tennessee	21706	359			
Texas	9131	39			
Utah	516	20			
Vermont	207	33			
Virginia	8809	115			
West Virginia	1252	69			

Source: Medical Reserve Corps, Office of the Surgeon General <http://www.medicalreservecorps.gov/FindMRC.asp> (accessed October 22, 2007).

During a major public health emergency, such as a pandemic disease outbreak, government health services and other resources will be quickly overtaxed. In addition to collaborating with the private sector and community groups, federal, state, and local governments will rely on volunteers to deliver essential care and services. The ability of trained volunteers to come to the aid of their fellow community members is part of the White House's *National Strategy for Public Health and Medical Preparedness*:[65]

"Where local civil leaders, citizens, and families are

educated regarding threats and are empowered to mitigate their own risk, where they are practiced in responding to events, where they have social networks to fall back upon, and where they have familiarity with local public health and medical systems, there will be community resilience that will significantly attenuate the requirement for additional assistance."

One way federal, state and local governments foster community resilience is through the recruitment of volunteers to Medical Reserve Corps (MRC) units. The MRC program is managed by the Office of the U.S. Surgeon General in coordination with the Office of the Assistant Secretary for Preparedness and Response (ASPR). According to the Medical Reserve Corps website, "MRC units are community-based and function as a way to locally organize and utilize volunteers – medical professionals and others – who want to donate their time and expertise to promote healthy living throughout the year and to prepare for and respond to emergencies. MRC volunteers supplement existing local emergency and public health resources."

According to the Bureau of Labor Statistics, more than a quarter of Americans volunteered through or for an organization at least once between September 2005 and September 2006.[65] This may range from one hour of service at a homeless shelter or a one-day trash-pick up effort to more significant volunteering on a weekly basis for a prolonged period. Of this group, 9.4 percent volunteered in either a health setting (such as a hospital or nursing home) or for public safety.[66] Based on these data, emergency response planners and public health officials could aim to recruit 9,400 Medical Reserve Corps volunteers per 100,000 persons.

The Bureau of Labor Statistics also notes, however, that 46 percent of American volunteers served 49 hours or less over the course of one year.[67] These short-term volunteers are unlike Medical Reserve Corps volunteers, who are often asked to train with their units and participate in state and local preparedness drills; and, who, if called upon, can be expected to serve over a prolonged period of time. Setting a threshold of 9,400 volunteers per 100,000 persons was, therefore, deemed far too rigorous.

Although the body of evidence-based research on public health emergency preparedness and response is growing, there is still no scientifically-sound data on what number of health-care volunteers per 100,000 persons is needed to respond to a mass casualty event. In the absence of federal guidelines and evidence-based best practices, TFAH set the threshold for this indicator at the 25th percentile, meaning 75 percent of states received a point for having met or exceeded 14 Medical Reserve Corps volunteers per 100,000 persons.

Thirty-seven states and D.C. met or exceeded the threshold of 14 volunteers per 100,000 North Dakota led the group with a total of 2,859 volunteers or 450 per 100,000 persons, followed by Tennessee with 359 volunteers per 100,000 and Massachusetts with 217 per 100,000. Thirteen states had fewer than 14 volunteers per 100,000. South Dakota failed to register a single volunteer and is listed as having 0 volunteers per 100,000, while Maine only had 3 volunteers per 100,000 and Louisiana had 5 per 100,000.

Medical Reserve Corps volunteers represent one segment of emergency response volunteers. In addition to the Medical Reserve Corps, administered by the Office of the U.S. Surgeon General, there is the **Community Emergency Response Team (CERT)** initiative run by the Office of Community Preparedness, Department of Homeland Security, and the **Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP)**, administered by the Office of Preparedness and Emergency Operations, Assistant Secretary for Preparedness and Response.

These groups join non-governmental groups such as the American Red Cross, the Salvation Army, and others in supplying volunteers to assist in emergency response and recovery. Using only Medical Reserve Corps numbers, therefore, does not give as complete a picture of community resiliency as one would like. Although the federal agencies that administer these programs were unable to provide TFAH with an accurate breakdown of ESAR-VHP volunteers and CERT volunteers on a state-by-state basis, both programs told TFAH that they expect to begin collecting the actual number of individual volunteers registered and/or trained in early 2008. (See **Appendix E: Community Resiliency** for the methodology and a detailed spreadsheet of Medical Reserve Corps volunteers by state.)

PRIVATE SECTOR AND COMMUNITY INVOLVEMENT IN PUBLIC HEALTH EMERGENCY PREPAREDNESS

Given the increasing importance of public-private partnerships in times of non-emergency, it is not hard to imagine that more is going to be asked of the private sector during a major public health emergency. The federal government has published several preparedness checklists for businesses and community groups, which are posted on the www.pandemicflu.gov website. In addition to following the steps in these checklists, business groups and community leaders are encouraged to meet with local, state, and federal planners to ensure that their expertise and capabilities are incorporated in pandemic and all-hazards preparedness response plans.[68] Business and community groups face twin challenges. They must plan to take care of their own employees and employees' families, while also developing a plan to coordinate with the federal and state preparedness efforts.

Businesses

Most companies take the threat of pandemic flu seriously. A 2006 survey of U.S. employers found that 72 percent believe planning can help protect their business from a pandemic's impact.[69] In spite of widespread acknowledgement that pandemic flu represents a serious threat, only 52 percent of respondents report having adequately planned to protect their staff and business interests in the event of a pandemic influenza outbreak, and more than half of respondents lack confidence in their company's ability to manage an aggressive influenza outbreak among employees.[70]

To promote private sector preparedness, in 2007 the U.S. Chamber of Commerce held a series of round table discussions around the country bringing together businesses, public officials and emergency planners to discuss pandemic preparedness. **Too often, however, many of the public-private partnerships that exist are driven by personal connections and do not include a representative sample of the businesses operating in the community.** A highly contagious strain of influenza will not discriminate among employees based on whom the CEO or owner knows. It is essential, therefore, that pandemic and all-hazards preparedness events include representatives from a broad spectrum of organizations.

Further steps state and local planning officials should take to boost private sector emergency preparedness include:

- Share state and local preparedness plans with the entire business community;
- Dedicate a staff member to serve as the business community liaison in the state preparedness office;
- Hold training events/workshops/exercises/etc. with the private sector; and
- Establish with whom and how public health officials should communicate with the business community in the event of an emergency.

PUBLIC-PRIVATE PARTNERSHIP

Business Executives for National Security (BENS): Georgia Business Force

The BENS Georgia Business Force is a consortium of companies partnering with the state to help deter and respond to terrorist attacks.[71] In October 2007, the group took part in the Community Continuity Atlanta Partnership (CCAP) exercise along with the Georgia Division of Public Health, the Georgia Emergency Management Agency, Emory University Rollins School of Public Health, and local health departments.[72] Close to 250 employees from 28 local companies participated in the week-long series of exercises. The final exercise was a mass anthrax countermeasure delivery drill, where business volunteers were given one hour of training to distribute the anthrax antidote and health information to volunteers acting as patients. According to Dr. Stuart Brown, Director of the Georgia Division of Public Health, "the use of private sector personnel in this manner leverages the public health workforce tremendously, brings in private sector expertise and benefits all of Georgia."[73]

COMMUNITY GROUPS

Community and faith-based organizations can play an important role in pandemic and all-hazards preparedness and response, particularly in communities wary of direct government intervention. They can help vet communication messages to ensure delivery in easy to understand, culturally sensitive terms. Messages coming from trusted community leaders are more likely to inspire responsiveness. After a disaster has occurred, community groups can transmit information from the ground back to emergency response teams to ensure that citizens' needs are met. Finally, community groups can play a role in response and recovery by delivering food supplies, checking in on sick or injured neighbors, and helping vaccinate members of the community.

Emergency planners need to reach out and engage with key community stakeholders in the planning stages. Too often, however, U.S. homeland security and public health emergency planners tend to overlook this sector of society.[74] Many New Orleans residents failed to evacuate in advance of Hurricane Katrina despite government warnings to do so because planners had not considered that many residents lacked the necessary funds or personal automobiles necessary for self-evacuation. Failing to include community groups in preparedness planning can lead to government designed plans that fail either because the message does not reach all the people it intended to reach, or because the planners fail to fully consider the cultural practices or socioeconomic conditions of the population.[75]

COMMUNITY ENGAGEMENT SUCCESS STORIES

Lincoln County, Wyoming: Community Food Supply Outreach[76]

The Lincoln County, WY Public Health Department and a local grocery store worked together to promote and facilitate emergency food and water stockpiling. The grocery store agreed to sell non-perishable goods at lower prices and allowed the Public Health Department to place posters with lists of individual preparedness items throughout the store. Customers who did not normally have the means to stockpile large amounts of food could buy and store preparedness products at lower prices and educate themselves with the associated materials. The project also helped grocers understand their role in providing critical food supplies during a pandemic.

New Mexico: Tribal Outreach in New Mexico[77]

The New Mexico Department of Health has led a community outreach project among 22 American Indian tribes in the state. Tribal preparedness is a significant component of overall preparedness, especially in the American Southwest and Plains states. One component of the outreach included a presentation to tribal members on pandemic and avian flu. The presentation contained culturally relevant information for the tribes, including the safety of eagle feathers obtained through the Fish and Wildlife Service repository.

Indicator 9: PUBLIC HEALTH PROGRESS -- SENIORS' SEASONAL FLU VACCINATION

FINDING: Flu vaccination rates for seniors decreased in 11 states.

39 states and D.C. increased or maintained rates for vaccinating adults aged 65 and older for seasonal flu (comparing 2003-2005 to 2004-2006) (1 point)				11 states DECREASED rates for vaccinating adults aged 65 and older for seasonal flu (comparing 2003-2005 to 2004-2006) (0 points)			
State	2003-2005 rates	2004-2006 rates	Increased (statistically significant) or maintained (where decreases are noted, they are not considered statistically significant)	State	2003-2005 rates	2004-2006 rates	Decreased (statistically significant)
Alaska	63.9%	62.5%	-1.3%	Alabama	65.7%	63.0%	-2.8%
Arizona	65.9%	64.7%	-1.2%	California	69.7%	67.9%	-1.9%
Arkansas	68.3%	67.5%	-0.8%	Florida	62.2%	60.7%	-1.5%
Colorado	75.7%	76.3%	0.6%	Idaho	66.8%	65.1%	-1.7%
Connecticut*	72.8%	71.8%	-1.1%	Iowa	74.4%	73.1%	-1.3%
Delaware	68.3%	68.5%	0.1%	Minnesota	78.9%	76.7%	-2.2%
D.C.	57.6%	56.9%	-0.8%	New Mexico	70.9%	69.3%	-1.6%
Georgia	64.1%	63.4%	-0.7%	Oklahoma	74.6%	72.9%	-1.7%
Hawaii	74.3%	73.9%	-0.4%	South Carolina	65.4%	63.2%	-2.1%
Illinois**	61.1%	62.6%	1.4%	South Dakota	77.0%	75.8%	-1.3%
Indiana	64.8%	64.5%	-0.3%	Washington	69.7%	68.8%	-0.9%
Kansas	68.3%	68.9%	0.6%				
Kentucky	65.3%	64.2%	-1.1%				
Louisiana*	66.6%	65.2%	-1.4%				
Maine	71.6%	70.6%	-0.9%				
Maryland	63.9%	63.3%	-0.6%				
Massachusetts	71.8%	71.1%	-0.7%				
Michigan**	67.2%	68.4%	1.3%				
Mississippi	65.8%	64.6%	-1.2%				
Missouri	66.9%	67.7%	0.8%				
Montana	71.5%	71.4%	-0.1%				
Nebraska	74.0%	73.9%	-0.1%				
Nevada	57.2%	56.5%	-0.7%				
New Hampshire	71.6%	71.0%	-0.6%				
New Jersey	66.1%	65.8%	-0.3%				
New York	65.3%	64.2%	-1.1%				
North Carolina	67.1%	67.3%	0.3%				
North Dakota	72.5%	71.9%	-0.5%				
Ohio	66.7%	66.8%	0.1%				
Oregon	70.1%	70.4%	0.3%				
Pennsylvania	64.0%	63.8%	-0.2%				
Rhode Island	72.1%	71.6%	-0.5%				
Tennessee	65.5%	66.1%	0.6%				
Texas	65.4%	65.0%	-0.4%				
Utah	73.2%	72.4%	-0.9%				
Vermont	69.0%	68.6%	-0.4%				
Virginia	68.3%	68.2%	-0.2%				
West Virginia	66.9%	65.9%	-0.9%				
Wisconsin	72.7%	72.7%	0.0%				
Wyoming	73.1%	72.5%	-0.6%				

Source: BRFSS. Data include 3 year comparisons. Please note that each state has a different sample size so the rates of increase and decrease are not comparable across states — each state has a different range to reach statistically significant changes.

*Puerto Rico had a statistically significant decreases in vaccination rates ($p<.10$)
*Connecticut and Louisiana had marginally statistically significant decreases in vaccination rates ($p<.10$)
**Illinois and Michigan were the only 2 states with marginally statistically significant increased in vaccination rates ($p<.10$)

Routine vaccinations have helped prevent countless illnesses and deaths, and are extremely cost-effective, sparing the health-care system the expense of caring for those who might otherwise become ill.

According to CDC, 5 to 20 percent of Americans contract the seasonal flu, more than 200,000 people are hospitalized from flu complications, and approximately 36,000 people die from the flu each year.[78] Certain people, such as the elderly, the very young, and those with compromised immune systems are more vulnerable to complications from seasonal flu.[79] Complications of flu can include bacterial pneumonia, dehydration, and worsening of chronic medical conditions, such as congestive heart failure, asthma, or diabetes. CDC's Advisory Committee on Immunization Practices (ACIP) recommends that individuals at high-risk for complications and their caregivers receive seasonal flu vaccinations at the beginning of each flu season.

This indicator measures how well states are vaccinating one key high risk group, adults aged 65 and older. Since seasonal flu vaccination efforts are also viewed as a way to help communities better prepare for larger public health emergencies, such as a pandemic flu, this indicator also measures that aspect of preparedness.

The data from this indicator are from CDC's Behavioral Risk Factor Surveillance System (BRFSS), an annual cross-sectional telephone survey of more than 350,000 adults over 18 years old (averaging more than 4,000 interviews by state) conducted by the health departments of all states and D.C. BRFSS is the primary source of health information for states. According to CDC, it is the largest telephone survey in the world and generates confidence intervals of less than plus or minus 3 percent.

CDC provides information from BRFSS to policymakers, including the U.S. Congress and state officials, and to the public. BRFSS data are then used to inform decisions about health policies, funding and activities. (For more information, see **Appendix F: Methodology for Flu Vaccination Rates**). There were no statistically significant increases in vaccination rates, although 39 states and D.C. statistically maintained their previous rates. These 39 states and D.C. received a point for this indicator. Flu vaccination rates for seniors showed a statistically significant decrease in 11 states.

FLU VACCINE EFFECTIVENESS IN SENIORS

CDC currently recommends flu shots for people at high risk for influenza-related complications and severe disease, including: children aged 6 to 59 months, pregnant women, and persons aged 50 years of age and older.[80]

The effectiveness of the vaccine in seniors (aged 65 and older), however, has been called into question by several studies.[81,82] First, studies note that while seasonal flu vaccines have "convincingly been shown to be effective in preventing influenza infection in healthy adults...no [randomized control trial] data conclusively show a similar benefit in those aged 70 years or more, the age group that accounts for nearly all influenza deaths."[83]

In addition, some researchers are questioning whether the flu vaccine helps prevent deaths among seniors 65 and older. They believe that differences in underlying health status between vaccinated and unvaccinated seniors are the likely cause of any measurable reduction in risk of death.[84]

While acknowledging that the flu vaccine is less effective among the elderly than in younger people, other scientists argue there are long-term benefits associated with flu vaccination among those 65 years of age and older.[85,86] After analyzing the effect of flu vaccination during 10 flu seasons, researchers found that vaccination was associated with an average reduction of 27 percent in the risk of hospitalization for pneumonia or influenza during influenza seasons, and with a 48 percent decrease in the risk of death from any cause.

Both sides support expanding the vaccination of schoolchildren, the group most likely to spread the flu virus.[87] It is unfortunate that influenza vaccination rates among children are even lower than among the general public with only 18 percent of children aged 6 to 23 months vaccinated.[88]

Despite the debate over the efficacy of flu shots in seniors, even those who argue against any effect recommend that seniors receive yearly flu vaccines because they do not have evidence that it causes any harm. In addition, there is a consensus for more research studies comparing new and potentially better vaccines for the elderly -- perhaps vaccines that combine live and killed viruses or larger doses of current vaccine formulations. There is also widespread advocacy for protecting seniors through increased vaccination of children and healthcare workers.

Indicator 10: FUNDING COMMITMENT -- PUBLIC HEALTH BUDGETS

FINDING: Six states cut funding for public health from FY 2005-06 to FY 2006-07.

44 states and D.C. increased or maintained level funding for public health services from FY 2005-06 to FY 2006-07 (1 point)		**6 states DECREASED funding for public health services from FY 2005-06 to FY 2006-07 (0 points)**
State and percent increase (adjusted for inflation)		**State and percent increase (adjusted for inflation)**
Alabama (2.3%)	Mississippi (39.8%)[2]	Indiana (-3.0%)
Alaska (9.5%)[2]	Missouri (26.2%)[5]	Montana (-13.4%)
Arizona (28.1%)	Nebraska (2.0%)[4]	Nevada (-3.0%)
Arkansas (7.8%)	New Hampshire (0.7%)	New York (-2.3%)
California (18.7%)	New Jersey (19.7%)	Texas (-9.1%)
Colorado (29.8%)	New Mexico (15.7%)	Wisconsin (-0.6%)[4]
Connecticut (9.6%)[2]	North Carolina (5.1%)[2]	
Delaware (27.0%)[2]	**North Dakota (42.9%)[7]**	
D.C. (13.7%)	Ohio (1.5%)[4]	
Florida (12.7%)[2]	Oklahoma (8.8%)[1]	
Georgia (0.2%)[6]	**Oregon (32.5%)**	
Hawaii (11.1%)[2]	Pennsylvania (5.8%)[2]	
Idaho (2.2%)	Rhode Island (9.7%)	
Illinois (7.1%)	South Carolina (0.3%)	
Iowa (8.5%)	South Dakota (0.8%)	
Kansas (22.8%)	Tennessee (16.8%)	
Kentucky (3.8%)	Utah (5.9%)	
Louisiana (20.1%)	Vermont (17.5%)[3]	
Maine (1.1%)[2]	**Virginia (9.3%)[4]**	
Maryland (8.0%)[2]	**Washington (16.3%)[4]**	
Massachusetts (8.0%)[4]	West Virginia (6.9%)	
Michigan (2.4%)[4]	**Wyoming (43.8%)**	
Minnesota (10.7%)[2]		

Source: Research by TFAH of publicly available state budget documents and interviews with health and budget officials in the states.

NOTES: Biennium budgets are bolded.

[1] *May contain some social service programs, but not Medicaid or CHIP.*

[2] *General funds only.*

[3] *Includes federal funds.*

[4] *Budget data taken from appropriations legislation.*

[5] *Missouri's percent change based on FY 2005-06 and FY 2006-07 actual expenditures.*

[6] *Georgia's budget data for FY 2006-07 taken from appropriations legislation.*

[7] *North Dakota's budget data for the 2007-2009 biennium taken from appropriations legislation.*

This indicator, adjusted for inflation, illustrates a state's commitment to funding public health programs that support the infrastructure needed to adequately respond to emergencies.

Presently, the bulk of public health emergency preparedness funding comes from the federal government. The PAHPA legislation states, however, that beginning with FY 2009, public health and hospital preparedness grant awardees must contribute **non-federal funds** to support the cooperative agreements. States are required to match 5 percent of the total federal funding for FY 2009, and 10 percent of the total amount thereafter.[89] Non-federal funds may come from state public funding or private donations and may be in cash or in kind. Those states with stagnant or decreasing state public health budgets may be challenged to identify funds required for the state match.

Every state allocates and reports its budget in different ways. States also vary widely in the specificity they provide. This makes comparisons across states difficult. For this analysis, TFAH examined state budgets and appropriations bills for the agency, department, or division in charge of public health services for FY 2005-2006 to FY 2006-2007, using a definition as consistent as possible across the 2 years, based on how each state reports data. TFAH defined "public health services" broadly, including most state-level health funding.

Based on this analysis, 6 states experienced cuts in their public health budgets. (For additional information on the methodology of the budget analysis, please see **Appendix G: Methodology for State Public Health Budget Indicator.**)

Several states that received points for this indicator may not have actually increased their spending on public health programs. The ways some states report their budgets, for instance by including federal funding in the totals or including public health dollars within healthcare spending totals, makes it difficult to determine "public health" as a separate item.

Few states allocate funds directly for bioterrorism and public health preparedness as part of their public health budgets. Instead, most rely on federal funds to support these activities. The infrastructure of other public health programs, however, also supports their underlying preparedness capabilities.

While this indicator examines whether state budgets increased or decreased, **it does not assess if the funding is adequate to cover public health needs in the states**. This also does not take into account ongoing hospital needs and funding.

FIRE LINE DO NOT CROSS

Federal Preparedness

SECTION 2

In this section of the report, TFAH examines federal preparedness activities.

Important new legislation was signed into law, and policy directives were issued relative to implementation of such legislation in the past year. This represents significant progress in the nation's preparedness as discussed below. However, TFAH finds that the federal government continues to lag in several key areas:

- The U.S. Congress has failed to deliver a sustained financial commitment towards preparedness – especially at the state and local level – where many of the essential preparedness and response activities occur;
- While federal agencies are slowly beginning to adopt measurable goals and outcome objectives for preparedness, they have failed to systematically collect data on all but a few of those performance measures and provide state-by-state reporting of the results. This lack of transparency limits the ability to gauge progress and identify vulnerabilities in national preparedness for all-hazards public health emergencies; and
- The federal government has failed to align its own policies with the recommendations and guidance it set forth for individual and household preparedness.

Issues addressed in this section include:

1. Implementation of the Pandemic and All-Hazards Preparedness Act (PAHPA) of 2006;
2. Pandemic Influenza planning and preparedness activities;
3. Funding for pandemic and all-hazards preparedness; and
4. Additional federal issues, including the lack of an emergency health benefit and deficiencies in sick leave policies and the shelf-life extension program for medications and vaccines.

1. The Implementation of the Pandemic and All-Hazards Preparedness Act

The Department of Health and Human Services has invested over $7 billion to prepare states and local public health departments and hospitals for public health emergencies and acts of bioterrorism since 9/11, and since FY 2006, an additional nearly $6 billion specifically for pandemic influenza preparedness, of which $600 million has gone to state and local health departments. This investment demonstrates the seriousness with which national leaders view these threats. The 2006 Pandemic and All-Hazards Preparedness Act (P.L. 109-417) further strengthens the nation's preparedness and response planning. Merely passing the legislation, however, is not enough. Accordingly, PAHPA set out a series of benchmarks for federal agencies to meet over the next 5 years. Seven of these deliverables were due no later than 180 days after the enactment of PAHPA, or by the end of June 2007. Another set of 4 deliverables are due no later than December 2007, or 12 months after enactment. Others come due over the 5-year span of the Act. **(For more details on deliverables and due dates under PAHPA see Appendix H: Key Deliverables and Due Dates under PAHPA (P.L. 109-417)).**

In November 2007, the Office of the Assistant Secretary for Preparedness and Response published the *Pandemic and All-Hazards Preparedness Act Progress Report* to update federal agencies, members of the U.S. Congress, state officials, the business

community, non-profits, the research community and the American public as to how HHS is meeting its commitments under the new law. The report found that significant progress had been made over the 10 months since the law's enactment. TFAH commends ASPR's progress in executing a majority of its 6 month benchmarks, especially in light of staffing and funding constraints, but recognizes that much remains to be done, specifically in respect to:

- Developing new, outcome-oriented performance measures;
- Collecting, reporting, and publishing data on federal and state preparedness;
- Enhancing real-time disease detection and surveillance; and
- Advancing research and development of countermeasures.

Performance Measures, Data Collection and Reporting

PAHPA requires the Secretary of HHS within 180 days of enactment to **develop and apply measurable evidence-based benchmarks and objective standards to measure the preparedness of state and local grantees**, including annual test and exercise requirements.[90] Where appropriate, however, the law allows the use of "existing objective standards."[91] Currently, HHS is using existing CDC Preparedness Goals which detail 23 proposed performance measures. Of these 23 assessments, states are required to collect data and report on only 6 of these to CDC.[92,93] The data from these 6 measures are then reported on an aggregated basis, without a breakdown of individual states' results. Americans can not, therefore, appropriately assess their states' progress or document how states have used taxpayer-supported preparedness funds. **The inability of states to quantify what federal preparedness dollars have achieved over the past 5 years is a serious weakness with the current system.**

HHS and CDC are in the process of developing, in coordination with research organizations and universities, a series of new performance measures that officials are aiming to roll out in 2009. These new measures will incorporate more drills and exercises to ensure that states' paper plans can deliver in a public health emergency.

RESEARCH PRIORITIES FOR EMERGENCY PREPAREDNESS AND RESPONSE

PAHPA directs the secretary of HHS to consult with schools of public health and research organizations to "define the existing knowledge base for public health preparedness and response systems, and establish a research agenda based on federal, state, local, and tribal public health preparedness priorities."[94] The Institute of Medicine (IOM) has agreed to conduct a fast-track study and issue a report that will "delineate a set of near-term research priorities for emergency preparedness and response in public health systems that are relevant to the specific expertise resident at schools of public health."[95] The IOM committee will meet over 4 days from December 18-21, 2007 and deliver its final report to CDC no later than February 25, 2008. The Office of the Assistant Secretary for Preparedness and Response (ASPR) and CDC's Coordinating Office for Terrorism Preparedness and Emergency Response (COTPER) will consider the IOM recommendations when developing the research funding announcements for CDC's Centers of Public Health Preparedness.

Near Real-Time Electronic Nationwide Public Health Situational Awareness Capability

PAHPA requires the Secretary of HHS within 180 days of enactment, to submit to the U.S. Congress **a strategic plan** outlining steps to develop, implement, and evaluate the near real-time electronic nationwide biosurveillance network and develop program elements and required activities.

Delivering effective public health services depends on timely and reliable information. Health departments cannot protect people from existing or emerging health threats, such as a disease pandemic, like influenza, without the right information. The lack of timely and comprehensive data can cause delays in identifying and responding to serious and mass emergency health problems.

As of November 2007, HHS had failed to submit a strategic plan to the U.S. Congress, as specified under PAHPA. According to the *Progress Report*, however, "HHS has taken steps towards developing a strategic plan for situational awareness by identifying existing information technology and reporting systems that track trends in public health and medical data and by piloting new systems that have the potential to improve situational awareness."[96] In addition, HHS is examining ways to integrate different surveillance systems and the disparate technology platforms they run on into an "overarching system that will improve situational awareness."[97]

REAL-TIME DISEASE DETECTION

PAHPA (Section 201H) authorized $35 million in CDC preparedness grants to states to fund one new program, **Real-Time Disease Detection**.[98] All 50 states and D.C. received FY 2007 funding for this new program and, under the CDC cooperative agreement, are required to establish real-time disease detection programs through the **Poison Control Center Partnership (PCC Partnership)**. This partnership is intended to supplement the ongoing disease surveillance carried out in states.

Every state and territory is served by a professional organization in the field of poison control, a state PCC, or a regional PCC. A 2005 study on PCCs and syndromic surveillance found that "PCC data might provide a useful addition to surveillance data reported to public health agencies for the early detection of foodborne disease outbreaks," and suggested that collaborative surveillance systems -- such as the PCC Partnership -- be developed to improve disease monitoring and tracking.[99]

Under the PCC Partnership, state health departments collaborate with a poison control center "to improve the early detection, surveillance, and investigative capabilities of poison control centers for chemical, biological, radiological, and nuclear events."[100]

This collaboration can take on several forms, such as:[101]

- Establishing systems to collect and submit near real-time poison center data relevant to rapid disease and detection of a chemical, radiological, or biological "event" electronically for review and analysis by a professional organization in the field of poison control and rapid reporting of suspicious events back to the relevant state health departments and CDC;
- Establishing priority health conditions and syndromes and points of contact at state health departments, the American Association of Poison Control Centers (AAPCC), and CDC;
- Developing protocols to investigate reports of priority health conditions and syndromes;
- Planning to provide surge capacity in the event of chemical, biological, radiological, or nuclear threat or exposure;
- Expanding existing telecommunication equipment to enhance the available number of workstations at each regional poison control center; or
- Improving the capabilities of poison control centers to provide information to health care providers and the public with regard to chemical, biological, radiological, or nuclear threats or exposures, in consultation with the appropriate state, local, and tribal public health entities.

This program is not a substitute for a strategic plan for the development, implementation, and evaluation of a near real-time electronic nationwide public health situational awareness capability. Collaboration among different surveillance systems, however, such as poison control centers, food safety labs, and clinical and university labs, is key to an effective nationwide public health surveillance system.

National Strategy for Research and Development

PAHPA requires within 180 days that the HHS Secretary: "**develop and make public** a strategic plan to integrate biodefense and emerging infectious disease requirements with the advanced research and development, strategic initiatives for innovation, and the procurement of qualified countermeasures and qualified pandemic or epidemic products."[102]

On July 7, 2007 HHS Secretary Michael Leavitt published a draft *BARDA Strategic Plan for Countermeasure Research, Development, and Procurement*, to "guide and facilitate the research, development, innovation, and procurement of medical countermeasures and build upon established national strategies and directives."[103] The draft plan includes language on the importance of addressing both bioterrorism threats and emerging infectious disease threats.[104]

BIOMEDICAL ADVANCED RESEARCH AND DEVELOPMENT AUTHORITY (BARDA)

PAHPA directed HHS to establish the Biomedical Advanced Research and Development Authority, or BARDA, and authorized funding of advanced development of medical countermeasures, such as vaccines, drugs, and diagnostic tools for public health emergencies.[105]

BARDA is the umbrella organization within the Office of the Assistant Secretary for Preparedness and Response that provides an integrated, systematic approach to the development and purchase of the medical countermeasures, treatments and diagnostic tools for public health medical emergencies. Upon its creation, BARDA assumed responsibility for 2 existing separate, but complementary projects: the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE) and Project BioShield.

PAHPA included authorization for approximately $1 billion for BARDA to support advanced research and development for FY 2007 through FY 2008. The U.S. Congress, however, did not appropriate money for BARDA in FY 2007 as the bill was signed into law **after** the FY 2007 spending bill was passed. Instead, a separate act, the U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 (P.L. 110-28) transferred $99 million from National Institutes of Health accounts to fund BARDA.[106]

To date, $55 million from that pool of funds have been allocated in the form of HHS contracts to 4 companies that are working on the advanced development of anthrax antitoxins, therapeutics and antibiotics for use against plague and tularemia.[107] The president's FY 2008 budget includes $189 million for BARDA.

There is some expectation between researchers and government officials that the establishment of BARDA and its oversight of Project BioShield may improve the chances of success during the development phase. According to the Congressional Research Service, "one of BARDA's roles is to support the advanced research and development of promising countermeasures. In theory, funding this part of the development process through such a dedicated mechanism could allow countermeasures to further mature through the development process longer before competing for a Project BioShield contract. This could reduce the risk that a countermeasure will fail while under a Project BioShield contract."[108]

Public Health Emergency Medical Countermeasures Enterprise (PHEMCE)

PHEMCE is a coordinated interagency effort by the Office of the Assistant Secretary for Preparedness and Response (ASPR) and includes three primary HHS internal agencies: the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), and the National Institutes of Health (NIH). The mission of PHEMCE is to:[109]

- Identify high threat areas and the appropriate medical countermeasures for such threats;
- Set goals for research, development and acquisition of medical countermeasures that are deemed necessary for high priority threat areas; and
- Plan deployment and use strategies for medical countermeasures held in the Strategic National Stockpile (SNS).

PHEMCE's mandate extends beyond chemical, biological, radiological and nuclear (CBRN) threats to encompass naturally emerging infectious diseases and pandemic threats, including pandemic influenza.[110]

PHEMCE Developments in Acquiring Critical Medical Countermeasures

- **Smallpox Vaccine:** On June 4, 2007, HHS awarded a contract to Bavarian Nordic A/S of Copenhagen, Denmark to manufacture and deliver 20 million doses of a Modified Vaccinia Ankara (MVA) smallpox vaccine. The MVA vaccine is to be administered or distributed to people with compromised immune systems, such as patients on chemotherapy, who cannot receive the live vaccine that makes up the bulk of the SNS supply.[111]
- **Anthrax Vaccines:** On September 26, 2007, HHS purchased 18.75 million doses of BioThrax (Anthrax Vaccine Adsorbed (AVA)) from Emergent Biodefense Operations of Lansing, Michigan. The BioThrax vaccine is intended to be used following an anthrax attack and, together with existing stockpiles of anthrax vaccine, allows HHS to maintain a stockpile of at least 10 million doses through 2011.[112]
- **Radiation Exposure Countermeasures:** On September 27, 2007, NIH released 2 separate funding opportunity announcements for different medical countermeasures to treat people exposed to radiation. One request for applications seeks to accelerate the development of medical countermeasures to enhance platelet regeneration after radiation exposure from radiological and nuclear terrorist attacks.[113] The second funding announcement seeks a company interested in developing effective countermeasures for radiation exposure induced burns, wounds, trauma, or infections.[114] Both application close dates are in January 2008 with an announcement of the winning bid expected in June 2008.

Project BioShield

Project BioShield was created in 2004 to jump-start the research, development, purchase, and availability of effective medical countermeasures against CBRN agents. One of its central features is "it provides countermeasure developers with a guaranteed government market for their products."[115]

In addition to serving as a secure funding source for the purchase of critical countermeasures, the *BioShield Act* gives NIH the power to expedite research and development of these medical countermeasures, and allows FDA officials to invoke an "Emergency Use Authorization" for medical countermeasures. This type of authorization grants a manufacturer permission to distribute a critical biomedical treatment to the public without the more rigorous testing and evaluation new drugs and treatment normally undergo before hitting the market.

In the past year Project BioShield has undergone government scrutiny. According to a report by the Congressional Research Service (CRS), HHS has awarded $1.8 billion worth of Project BioShield contracts, which focus on 3 priority threat areas: anthrax, botulinum toxin (a naturally occurring neurotoxin protein that is one of the most poisonous naturally occurring substances in the world), and radiological and nuclear agents.[116]

Although close to 80 percent of Project BioShield funding awards have been for research and development on anthrax-related countermeasures, anthrax vaccine development has not progressed as anticipated.

The largest Project BioShield contract HHS and ASPR awarded went to a small biotech company, VaxGen, in November 2004. The $877.5 million procurement contract for VaxGen was for the manufacture and delivery of 75 million doses of its rPA anthrax vaccine to the SNS. Two years later, however, on December 17, 2006, ASPR terminated VaxGen's contract for failure to meet a critical contractual milestone.

According to an October 2007 Government Accountability Office (GAO) report, there were 3 major factors behind HHS's decision to cancel the Project BioShield contract with VaxGen.[117]

1. ASPR awarded the contract to VaxGen, a small biotech firm with no experience manufacturing anthrax vaccine. The contract required 25 million doses of vaccine in 2 years; a milestone that would be difficult for a large vaccine manufacturer to meet and completely out of reach for VaxGen.
2. VaxGen took unrealistic risks in accepting the contract given the size of the company and the lack of in-house experience and knowledge.
3. FDA requirements for a new generation anthrax vaccine were not published at the time of the contract, which led to confusion about product design.

In testimony before the U.S. Congress, Keith Rhodes, an author of the GAO report, stated that "the failure of this procurement effort raised larger questions regarding the country's ability to develop a new anthrax vaccine and a robust and sustainable biodefense medical countermeasure industry by building a partnership between pharmaceutical and biotechnology firms and the government."[118] He also noted that "the biotech industry has raised concerns about whether the government can clearly define its requirements for future procurement contracts."[119]

To avoid making the same mistakes in future BioShield procurements, GAO recommends that the secretary of HHS direct ASPR, NIH, FDA and CDC "to ensure that the concept of use and all critical requirements are clearly articulated at the outset for any future medical countermeasure procurement."[120]

2. Pandemic Influenza Planning

National Strategy for Pandemic Influenza

The White House issued the *National Strategy for Pandemic Influenza* in November 2005, which was followed up with the *National Strategy for Pandemic Influenza: Implementation Plan* in May 2006. The *Implementation Plan* contains more than 300 specific actions for federal departments and agencies and serves as a roadmap towards pandemic preparedness. A one-year summary of the implementation plan found that significant progress had been made. According to the report, "approximately two-thirds of the 324 actions in the National Plan were targeted for completion within one year of the national Plan's release." Of these "one-year" actions, nearly 90 percent have been completed.[121] Upon issuance, TFAH commended the federal government's progress in executing a majority of its 12 month benchmarks, but recognized that much remains to be done, specifically in respect to:

- "Real-time" disease detection and clinical surveillance;
- Mass casualty care or surge capacity;
- Swift distribution of needed medical countermeasures; and
- Legal and feasibility issues associated with community mitigation strategies.

In fact, these 4 areas are of crucial importance to pandemic preparedness and, if unaddressed, would significantly limit the effectiveness of the national pandemic response.

In addition, TFAH strongly recommends that the National Plan be updated as scientists learn more about pandemic influenza and how to control its spread as well as to reflect lessons learned from planning and exercises associated with pandemic preparedness.

A GAO review of the national strategy to combat influenza cited several other problems, including the:[122]

- Lack of clarity regarding coordination between HHS and DHS regarding leadership roles and responsibilities during a pandemic crisis;
- Absence of national exercises or drills to test a multi-sector, multi-jurisdictional response to a pandemic outbreak;
- Lack of clear links between performance measures and intended results; and
- Failure to call for specific investments and resource development needed to implement the actions called for in the National Strategy for Pandemic Influenza.

Review of State Pandemic Plans

Five years ago, only 13 states had a final or draft pandemic plan publicly available.[123] As of October 2007, all 50 states and the D.C. had a version of their pandemic plan available online at www.pandemicflu.gov. **A review of these plans by TFAH in the Fall of 2007, however, revealed that many states have outdated plans posted online. In addition, the type of publicly available document varies from a comprehensive pandemic flu plan to free-standing annexes to emergency management plans, to mere summaries of a state's pandemic preparedness plan.**

The unique challenges of preparing for and confronting a pandemic flu merit special consideration.

- It is likely that nearly all 50 U.S. states and the District of Columbia will be affected at roughly the same time; and
- Experts predict a pandemic will occur in multiple waves of 6 to 12 weeks, resulting in multiple periods of surge demand for healthcare and treatment nationwide.

To ensure continuity among state and federal pandemic planning, PAHPA requires the Secretary of HHS within 180 days of enactment, or no later than June 2007, to develop criteria for state pandemic influenza plans.[124] The HHS, in coordination with the Department of Homeland Security (DHS), provided a template with **review criteria**, scor-

ing schema, and review group information to the states in a letter dated January 26, 2007. According to ASPR's *Progress Report*, a revised set of state pandemic planning criteria will be developed and disseminated to states.[125]

Providing states with revised criteria should help standardize and strengthen individual state pandemic preparedness plans.

In order to evaluate state preparedness, HHS asked all 50 states and D.C. to submit abstracts of updated pandemic flu plans to CDC by April 16, 2007.[126] As of November 2007 the most up-to-date versions of the state pandemic plans submitted to HHS were **unavailable to the public**, and HHS has not publicly released the results of its state-by-state review. HHS and other federal agencies, however, reviewed the state plans and "HHS compiled the results into state-specific draft interim assessments," which they shared with states.[127]

Earlier reviews of state pandemic preparedness plans, such as a 2006 report by Research Triangle Institute, found considerable variation among state plans, and gave 2 reasons for the differences: 1) weak federal direction, and 2) lingering questions about the epidemiology and control of pandemic influenza.[128]

A Congressional Research Service (CRS) report that analyzed all state pandemic plans available as of **July 2006** identified the following areas as needing improvement:[129]

- Prioritization of limited medical assets such as vaccinations and antivirals;
- Early detection and ongoing disease surveillance;
- Legal liability and civil rights issues associated with disease control measures; and
- Lack of clear leadership roles and coordination among different actors.

The CRS report also found a wide range of variability among state plans. While some variability is to be expected given the autonomy of states and their differing needs, the CRS report authors believe planning for a pandemic requires a more standardized approach. They acknowledged, however, that what exactly the standard operating procedure should be during a pandemic remains unclear. "For example, uncertainties about the ways in which flu spreads, the lack of national consensus in matters of equity in rationing, and a long tradition of federal deference to states in matters of public health, all complicate efforts to set uniform planning requirements for states."[130]

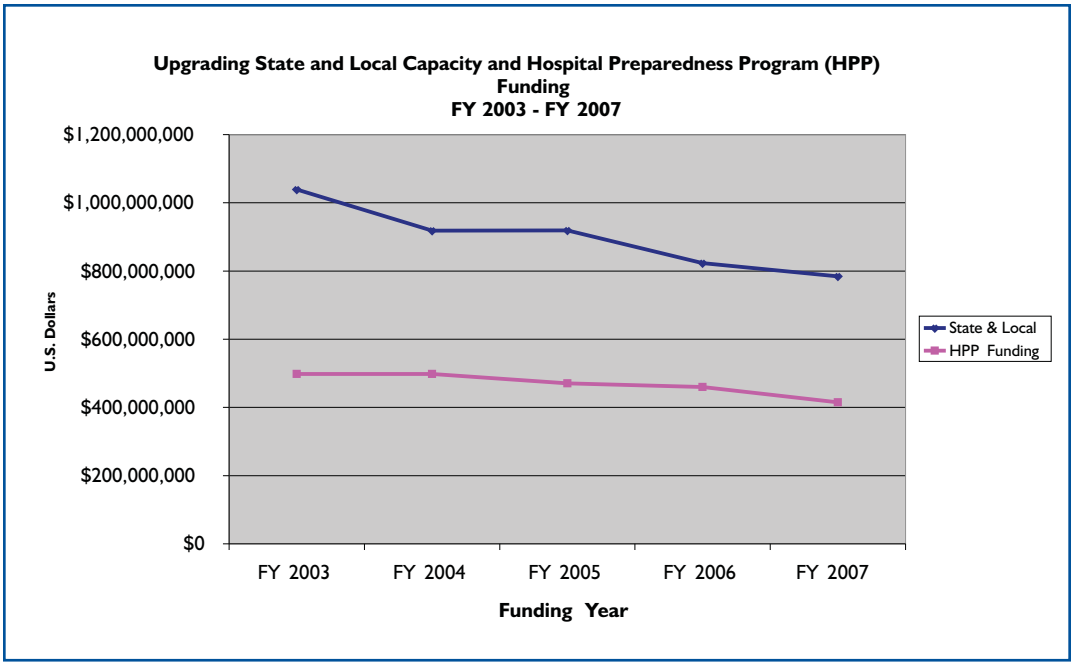
3. Federal Preparedness and Pandemic Funding

Although the federal government has made a substantial investment in public health and pandemic preparedness, the funding has been **inconsistent and unpredictable**. The Bush Administration's FY 2008 budget includes a $146 million cut in programs dedicated to bioterrorism and public health preparedness capabilities, specifically programs intended to upgrade state and local capabilities and hospital readiness. This represents a more than 25 percent cut from the public health preparedness funding level in FY 2005.

A report by the National Association of County and City Health Officials (NACCHO) found that federal funding cuts resulted in:[131]

- 28 percent of local health departments cutting staff time on preparedness, which led to either delays in completion of preparedness plans or delays/cancellations of workforce training;
- 40 percent of local health departments delaying or canceling acquisition of equipment and supplies; and
- Difficulty hiring needed and qualified staff.

Funding is also a concern for the Hospital Preparedness Program (HPP). As one grantee noted in a January 2007 conference call with HHS, "we need...some reassurance about the availability of funding that would be available to the Department of Health. Otherwise our staff will start looking for positions elsewhere because of insecurity and uncertainty of what the future holds."[132]



Source: State & Local Funding, CDC Financial Management Office. HPP Funding, ASPR

PANDEMIC INFLUENZA FUNDING

Federal funding for HHS for pandemic influenza planning totaled $5.62 billion dollars in FY 2006. For FY 2007, only $108 million in additional funds were appropriated for activities at CDC, FDA, and NIH.[133]

Of the $5.62 billion, $600 million were to be allocated toward state and local pandemic influenza preparedness. In August 2007, $75 million of this funding was distributed to state health departments through the Hospital Preparedness Program Cooperative Agreement for a one-time pandemic influenza response planning grant.

The $75 million in supplemental funding will be used to:[134]

- Establish or enhance stockpiles of critical medical equipment and supplies;
- Continue development of plans for maintenance, distribution and sharing of those resources;
- Plan for and develop pandemic alternate care sites; and
- Conduct exercises to prepare for or approximate a surge in health needs.

FY 2008

The president's $1.2 billion budget request for pandemic flu preparedness for FY 2008 included $870 million for one-time funding for vaccine and antiviral purchases and the development of rapid diagnostics, as well as $322 million for ongoing pandemic preparedness activities at CDC, FDA, NIH, and the Office of the Secretary of HHS. The president's budget did not include any money for state and local pandemic flu preparedness.

Tracking of Federal Preparedness Dollars

Under PAHPA, entities that receive cooperative agreement emergency preparedness funds are required to submit annual reports to the HHS secretary describing funded activities and the entities' performance with respect to program goals and objectives, appropriate budget information, and other reporting requirements.[135]

According to ASPR's Progress Report, **HHS is in the process of establishing guidelines for standardized reports from awardees**.[136]

USE OF PREPAREDNESS FUNDS AND PUBLIC HEALTH CAPABILITIES

- **Congressional Research Service (CRS)**: A 2007 report found and listed several reasons why tracking federal funding for pandemic preparedness is difficult. Among them, pandemic flu funds do not reflect the true amount of money being spent on pandemic preparedness since many activities that support pandemic preparedness also support public health preparedness in general or seasonal flu preparedness. But, most importantly, pandemic flu funding is difficult to track because "federal agencies may not prepare budget information...in a consistent fashion."[137]
- **Government Accountability Office (GAO)**: After the response to Hurricane Katrina demonstrated the failure of U.S. emergency preparedness planning, members of the U.S. Congress asked GAO to investigate whether the federal government is adequately prepared to lead the nation in planning for and responding to a pandemic flu. A 2007 GAO report found that clear leadership roles are still not defined in the *National Pandemic Influenza Strategy*. The GAO report also criticized the plan for "lack of a clear linkage between the performance measures and intended results" which makes assessing and evaluating progress on pandemic preparedness difficult.[138]

4. Additional Federal Issues

A. Emergency Health Benefit

In the event of a pandemic flu, the expected demand on the U.S. health care system would be extraordinary. The HHS Pandemic Influenza Plan projects that a pandemic could result in 45 million additional outpatient visits, with 865,000-9,900,000 individuals requiring hospitalization, depending on the severity of the pandemic.

With nearly 16 percent of Americans lacking health insurance coverage, the financial impact on the country's public health and health care systems could be disastrous, if hospitals, community health centers, and primary care facilities treat large numbers of uninsured.[139] If these facilities turned away the uninsured, treating and containing the further spread of a pandemic would be nearly impossible.

The percentage of people by state without health insurance ranges from a high of 24.5 percent in Texas to a low of 8.6 percent in Rhode Island. According to the Center for Biosecurity at University of Pittsburgh, U.S. hospitals could lose as much as $3.9 billion in uncompensated care and cash flow losses in a severe pandemic.[140] This strain could force hospitals to close down during or immediately after a pandemic, with long-term negative consequences for the health care delivery system.[141] (Please see **Appendix I: Estimated Mortality and Morbidity for a Severe Pandemic and Impact on Uninsured Population** for more information.).

To save lives, contain any pandemic to the degree possible, and ensure a functioning health care system throughout and after such a catastrophic emergency, the federal government should act now to create a framework for emergency health coverage and reimbursement.

A public health emergency benefit would have to address 2 separate concerns for providers and patients. It would have to guarantee providers some level of compensation for the services they provide during a pandemic, while encouraging individuals to come forward for diagnosis or treatment.

For the health care system, the emergency benefit would mitigate the economic impact of providing such a high level of emergency care (much of which may be uncompensated), while also forgoing revenue generating activities (such as elective surgeries), which could place hospitals and other health care providers in financial jeopardy.

The benefit would also encourage the uninsured or underinsured who fall ill with influenza to access primary care services for prompt diagnosis and treatment and not be delayed due to concerns about their inability to pay for services. Delayed diagnosis may eliminate the potential value of isolation or quarantine measures, thereby allowing infection to spread. Similarly, delayed diagnosis might render useless potential treatment with antivirals, since such treatment must begin early after infection.

The federal government could act to lessen the problem. For instance, the creation of a stand-by emergency authority could, upon appropriation of funds by the U.S. Congress, permit the secretary of HHS to declare a public health emergency and provide temporary emergency health benefits to individuals who are uninsured or underinsured. An emergency fund would be established to pay for these services at Medicare rates. The benefits would last for 90 days or fewer, although the secretary could extend them for an additional 90 days if necessary.

It is best to create these mechanisms prior to an emergency, rather than in the heat of the moment when any delay would be counted in lives lost. In addition, prior planning may enable the government to be more cost-effective in using scarce resources. The benefits described here could be expanded beyond preparing for and enduring a possible pandemic. As was the case during Hurricane Katrina, unusual demands on the health care system can occur through various types of catastrophic emergencies. The secretary could have the authority to trigger the availability of these benefits during other catastrophic national and/or regional emergencies.

B. Emergency Sick Leave

Controlling the spread of a pandemic flu will depend on keeping infected persons away from the uninfected as much as possible. Doing so includes getting the infected and their families to stay home from work. CDC guidance issued in February 2007 includes the recommendation that sick people stay home from work for 7 to 10 days and that family or household members of those sick remain at home for 7 days.[142] This stay-at-home policy will limit the contact of sick people, and their potentially infected families, with others when they are contagious. These recommendations raise a troubling issue, however, because 48 percent of private-sector workers in the U.S. lack paid sick leave benefits and 94 million Americans do not have a single paid sick day they can use to care for a sick child.[143]

According to an October 2007 public opinion survey that Greenberg Quinlan Rosner Research conducted for TFAH, nearly 9 out of 10 Americans indicate that they would abide by a voluntary quarantine and stay home in the event of an outbreak of a pandemic flu.[144] Among the 10 percent who report they would not adhere to the government's request of a voluntary quarantine, most indicate they could not stay at home due to fears of losing needed income (64 percent) or losing their jobs altogether (39 percent). Fifty-four percent of those who would not remain at home indicate they work as essential personnel and would still be required to work.

A 2006 Harvard University survey found that while the vast majority of Americans would follow social distancing guidelines, such as avoiding public events (92 percent), avoiding malls and shopping centers (91 percent), and limiting use of public transportation (89 percent), though far fewer would stay home from work (57 percent).[145] Of those who indicated they would have difficulty staying home from work in a pandemic, 48 percent cited lost pay and resulting money problems as a reason. Twenty-seven percent said they would likely lose their jobs or business if they stayed home for 7 to 10 days. This disincentive to stay home from work during a pandemic could be a serious obstacle to controlling the spread of disease and resulting illness and fatalities.

An existing program, the Disaster Unemployment Assistance Program, is a U.S. Department of Labor effort administered by states as agents of the federal government. It provides financial assistance to individuals whose employment or self-employment has been lost or interrupted as a direct result of a major disaster declared by the president of the United States. It is unclear, however, if the Disaster Unemployment Assistance program as it is currently set up would cover workers without sick leave who quarantine themselves or their families. The federal government or the U.S. Congress should move to clarify this.

Proposed legislation that seeks to address this need includes the Healthy Families Act (HR 1542/S 910). This legislation would require employers with 15 or more employees to offer 7 paid sick days each year, to be used to deal with individual medical needs or to care for sick family members. While some argue that this legislation is good for public health in general, others point out that 7 days of paid sick leave may not be enough to minimize the spread of disease during a public health emergency such as a potential pandemic flu outbreak. Nor does the legislation conform with the CDC recommendation for possible self-quarantine for up to 10 days. TFAH, however, encourages the U.S. Congress to expand paid sick leave to ensure economic stability and minimize health risks during a pandemic or infectious disease outbreak.

C. Shelf-Life Extension Program

The Shelf Life Extension Program (SLEP) is administered jointly by the Food and Drug Administration (FDA) and the U.S. Department of Defense (DOD). The Strategic National Stockpile (SNS) also participates in the program.[146] DOD and SNS both maintain large stockpiles of medications and vaccines in order to ensure that both military and civilian populations have access to needed antidotes, and treatments in the event of a medical emergency. In order to save federal dollars, FDA and DOD developed a system of extending the shelf life of these drugs and vaccines beyond the manufacturer's expiration date. **While the program has resulted in substantial savings at the federal level, states' stockpiles of antivirals – purchased through a HHS-subsidized program as part of states pandemic preparedness – are not eligible.**

HHS designated $170 million to subsidize states' purchases of up to 31 million treatment courses of Tamiflu (oseltamivir) and Relenza (zanamivir). HHS will subsidize 25 percent of the cost, and states will pay the other 75 percent. Forty-three states and D.C. have made a good faith effort to purchase some, if not all, of their allotment of federally-subsidized antivirals. Eighteen states purchased their entire allocation, while 15 states purchased additional unsubsidized treatment courses.

In 2006, the Association of State and Territorial Health Officials (ASTHO) surveyed its members regarding the stockpiling of antivirals. At the time, states indicated that inventory management, including the storage, rotation, and shelf-life extension strategies, were of critical concern.[147] State public health budgets are stretched thin already. Without a federal compromise on the SLEP, many states will be unwilling to commit scarce dollars to buy antivirals that will expire in only 7 years.

D. Aligning Federal Policies with Federal Preparedness Guidelines

Among the federal guidelines for individual and household preparedness is the need for Americans to stockpile enough of their essential prescription medications for 2 weeks.[148] Many Americans, however, rely on government health insurance plans such as Medicaid, Medicare, and S-CHIP in order to buy prescription drugs. These people are unable to buy extra medicine to stockpile in case of a public health emergency.

The federal government should clarify existing policies or enact new legislation that is in line with its own preparedness recommendations.

E. Federal Food Safety Reforms

According to a 2007 GAO report, "the federal oversight of food safety is fragmented, with 15 agencies collectively administering at least 30 laws related to food safety."[149] As a result, federal food safety oversight makes poor use of available resources and is now listed as one of the government's "high risk" programs. In addition to inadequate leadership and coordination within the U.S., the U.S. food safety system lacks appropriate priorities for the sophisticated and globally connected world of food production. The focus should be on reducing foodborne disease in the U.S. and maintaining public confidence in food safety and the food supply.

Inadequate Leadership and Coordination

The 4 agencies with the largest roles include the U.S. Department of Agriculture's (USDA) Food Safety and Inspection Service (FSIS), the Food and Drug Administration's (FDA) Center for Food Safety and Applied Nutrition (CFSAN), the FDA's Office of Regulatory Affairs, and the U.S. Centers for Disease Control and Prevention's (CDC) Food Safety Office.

FSIS and CFSAN are the 2 agencies currently with lead authority for food safety policy and standard setting. While FDA's Office of Regulatory Affairs inspects and enforces standards for FDA-regulated products, and CDC performs an independent illness surveillance function. Neither FSIS nor CFSAN, however, has the statutory authority or practical mandate to forge an integrated strategy that puts the research, regulatory, and educational tools of government to work in a coherent way to minimize risks.

Food safety problems occur in part because responsibilities are still divided among several agencies, and each of these agencies operates independently with different regulatory approaches.

Outdated Priorities and Resource Allocation

As lawmakers address new threats, they typically amend existing laws or enact new ones without updating previous statutes. Many of today's food safety laws are antiquated and have not been updated to address newer threats or deemphasize threats that have been diminished due to modern farming practices and technology. The current organizational and legal patchwork results in divided jurisdictions for specific food items among different agencies, which then have different authorities and responsibilities.[150]

For example, food safety historically was under the auspices of USDA because it was seen more as a veterinary and animal health issue. With the growing use of chemical additives in food in the 1930s, however, the bulk of the regulatory oversight shifted to FDA. Despite this change in regulatory power, two-thirds of the current U.S. food safety budget still goes to USDA, while only one-third goes to FDA, even though the latter agency is responsible for overseeing 80% of the food supply.[151]

The recent series of foodborne illness outbreaks in the U.S. suggests the problem is worsening and will continue to deteriorate further without intervention.

SECTION 3

Hospital Emergency Preparedness Survey

HOSPITAL EMERGENCY PREPAREDNESS SURVEY 2007

According to a new survey of U.S. infection control professionals, U.S. hospitals have made great strides in preparedness, but much remains to be done.

Improvements

- 76 percent of hospitals have plans to care for patients at alternative care sites in the event of a major health emergency.
- 53 percent of hospitals have plans to call up additional staffing resources, such as retired medical professionals, during an emergency.

Concerns

- Only 43 percent of hospitals offer any incentives to encourage healthcare workers to continue to come to work in the event of a major disaster.
- 20 percent of hospitals with emergency preparedness plans to care for patients at alternative care sites, do not have realistic plans to staff these sites.

This dissonance between planning for alternative care sites while failing to have personnel plans appropriate to a surge in patients reveals major shortcomings in U.S. hospital planning

The 2007 Hospital Emergency Preparedness Survey was conducted by the Association for Professionals in Infection Control and Epidemiology (APIC) of their members who are experts in infection prevention in hospitals. Six hundred and thirty APIC members responded to the survey developed by members of APIC's Emergency Preparedness Committee Advisory Board and TFAH.

Some highlights from the 2007 survey are presented below. For a detailed methodology please see **Appendix J: Methodology of APIC Survey**. (Note: In 2005, the *Ready or Not?* report included a similar survey that provided responses on a state-by-state basis.)

THE ASSOCIATION FOR PROFESSIONALS IN INFECTION CONTROL AND EPIDEMIOLOGY (APIC)

APIC's mission is to improve health and patient safety by reducing risks of infection and other adverse outcomes. The Association's more than 11,000 members have primary responsibility for infection prevention, control and hospital epidemiology in health care settings around the globe, and include nurses, epidemiologists, physicians, microbiologists, clinical pathologists, laboratory technologists and public health practitioners. APIC advances its mission through education, research, collaboration, public policy, practice guidance, and credentialing. The organization, based in Washington, D.C., is led by an elected board of members who volunteer their time and expertise.[152]

1. Alternative Care Sites:

Survey participants were asked: *"In the event of a major health emergency, has your hospital established plans or been involved in state or local planning efforts to care for a patient at a non-healthcare/alternative facility, such as a community center, sports arena, or hotel?"*

According to the APIC survey, **76 percent of respondents** have either established plans or been involved in state and local planning efforts to prepare for a surge of excess patients by planning to use alternative care sites as overflow/temporary patient sites.

Surge capacity is defined as a health care system's ability to expand quickly to meet an increased demand for medical care in the event of bioterrorism or other large-scale public health emergencies.[153] An accurate estimate of surge capacity is critical for preparedness planning.[154] Estimating surge capacity, however, is complicated since emergency planners must anticipate how much surge is needed for 2 distinct scenarios. The first is a time-limited public health emergency, such as a terrorist attack, an earthquake, or other natural disaster, during which resources from unaffected areas can be mobilized to assist those in need. The second is a widespread, prolonged event, such as pandemic influenza, during which all resources will be used and rationing of scarce supplies and staff is needed.[155]

During mass-emergency and infectious disease situations such as pandemic influenza, many hospitals and healthcare delivery providers will face surge conditions, for which the demand for hospital beds and equipment far surpasses the available supply. In the event of a public health emergency, it may be necessary to use alternative care sites such as community centers, churches, motels and sports facilities as temporary, makeshift health centers. Due to the challenges associated with providing care in these non-traditional sites, states, and communities must address related planning procedures and legal and regulatory concerns before the event occurs.

ALTERNATIVE CARE SITES (ACS)

The concept of providing medical care in a non-hospital setting is not new. In fact, alternative care sites have been used at various points in U.S. history, including during the Civil War, the aftermath of the San Francisco earthquake of 1906, the pandemic flu of 1918-1919, and, more recently, the aftermath of Hurricane Katrina and the 2007 Southern California wildfires.

Alternative care sites generally are defined as "locations, preexisting or created, that serve to expand the capacity of a hospital or community to accommodate or care for patients or to protect the general population from infected individuals during mass casualty incidents."[156]

The Joint Commission on Accreditation of Healthcare Organizations lists 3 types of alternative care sites:

- **Facilities of opportunity**, which are defined as non-medical buildings which, because of their size or proximity to a medical center, can be adapted into surge hospitals;
- **Mobile medical facilities**, which are mobile surge hospitals based on tractor-trailer platforms with surgical and intensive care capabilities; and
- **Portable facilities**, which are mobile medical facilities that can be set up quickly and are fully equipped, self-contained, turnkey systems usually stored in a container system and based on military medical contingency planning.[157]

Despite the clear need for alternative care sites following a mass casualty event, there are several barriers to their successful roll-out, including:

- Unclear delineation of responsibilities and authority among state, local and regional partners;
- Need for cohesive coordination between public and private healthcare practitioners with differing allegiances to various agencies;
- Healthcare staff and administrators must be willing and able to report to work and stay at work during a public health emergency;
- Continued reliance on table-top exercises instead of operational drills to test the deployment of mobile units and the creation of alternative care sites;
- Licensing and liability concerns for healthcare workers and volunteers; liability concerns for non-healthcare volunteers and third-party entities that play host to alternative care sites; and
- Funding and compensation issues.[158]

In addition, emergency planners will need to obtain, stockpile and store supplies, equipment and medicines for use in the alternative care sites.

THE HOSPITAL PREPAREDNESS PROGRAM (HPP)

The Pandemic and All Hazards Preparedness Act of 2006 (PAHPA) transferred the National Bioterrorism Hospital Preparedness Program (NBHPP) from the Health Resources and Services Administration (HRSA) to the newly created office of the Assistant Secretary for Preparedness and Response (ASPR), and the NBHPP was renamed the Hospital Preparedness Program (HPP). In addition to the new name, the program's focus expanded from bioterrorism to all-hazards preparedness. Under PAHPA, the following capabilities must be prioritized:

- Interoperable communications system;
- Bed tracking system;
- Emergency System for the Advance Registration of Volunteer Health Professionals (ESAR-VHP);
- Fatality management plans;
- Hospital evacuation plans; and
- National Incident Management System (NIMS) compliance.

If states had addressed the capabilities listed above, PAHPA allowed those states with adequate funding to address the following issues during FY 2007:

- Alternate care sites (ACS);
- Mobile medical assets;
- Pharmaceutical caches;
- Personal protective equipment; and
- Decontamination.

Surge Capacity Guidance

Prior to the creation of ASPR, HRSA developed hospital surge capacity guidance that requires states to create healthcare systems that, at a minimum, provide triage treatment and initial stabilization above the current daily staffed bed capacity for the following patient populations requiring hospitalization:

- 500 cases per 1 million population with infectious diseases;
- 50 cases per 1 million with chemical toxicity;
- 50 cases per 1 million with burns or trauma (blast); and
- 50 cases per 1 million with radiation injury.

Many public health experts, however, find these requirements arbitrary and unhelpful. According to an October 2007 report by PriceWaterhouseCoopers, "in a city of one million being served by multiple hospitals, how is preparation for the 500 cases [with infectious diseases] distributed among hospitals? Bed availability varies by region, and census fluctuates widely by time of day, day of week, and month or season."[159]

To help address this, the Agency for Health Research and Quality (AHRQ) commissioned a report "to develop, implement and evaluate a real-time electronic hospital bed tracking/monitoring system that will serve as a demonstration management tool to assist in a system/region's ability to care for a surge of patients in the event of a mass casualty incident."[160] The initial pilot project tested in the report ran into some difficulties, including reluctance on the part of some hospitals to share bed availability data. Overall, however, the report found that the project "has demonstrated the feasibility and utility of a system that captures and integrates currently accessible bed availability data from divergent systems in use across the country and coupling those data with data from hospitals that do not currently participate in these systems to produce a large-scale picture of patient bed availability across the country."[161]

Surge Capacity Funding

In addition to concerns about the value of current ASPR/HRSA hospital surge capacity guidance, resources are also a critical issue. Although the HPP has provided funding to hospitals of approximately $500 million per year, this only comes to about $100,000 per year per hospital.[162] According to the Center for Biosecurity, the minimum costs of developing and maintaining surge capacity during a severe pandemic for an average size hospital are close to a $1 million one-time investment coupled with $200,000 in annual maintenance costs.[163]

2. Workforce Incentives

Survey participants were asked: *"Does your hospital currently have a plan or incentives to encourage healthcare workers to continue to come to work during a major infectious disease outbreak or disaster?"*

Workforce continuity is a critical component of an effective response to a mass-emergency event. Hospitals may find that in a public health emergency many of their staffers may be unwilling to report to duty either because of fear for their own safety or for their family's safety. Incentives to encourage healthcare workers to report for duty, therefore, may be necessary to meet surge capacity staffing levels. Such incentives might include priority receipt of countermeasures or vaccines, paid time off (after the outbreak), housing for family members, other financial incentives, daycare and food for staffers' children and elderly relatives, and shelter, food, and care for staffs' pets.[164]

Only **43.3 percent** of those surveyed, however, reported having incentives or provisions to encourage health care workers to report to work in the event of a mass-casualty event.

3. Surge Workforce

Survey participants were asked: *"Does your hospital's emergency surge capability plan incorporate additional staffing resources, such as retired medical professionals (doctors, nurses, etc.), and/or contracts for temporary agency workers?"*

According to the Congressional Research Service, surge workforce capabilities are a key factor in public health preparedness:

"Though there are federal and state efforts to stockpile vaccines, drugs, ventilators, and other supplies, the ***healthcare workforce*** *is likely to be the key limiting factor in ramping up healthcare service delivery during a pandemic."*[165]

Providing incentives to current medical staff is one way to ensure workforce capacity is available. Another means to boost surge workforce capacity is to rely on outside healthcare volunteers, such as retired practitioners or practicing clinicians from out of state. This presents challenges as during a pandemic out-of-state volunteers are likely to be working in their home states, or, like others in the population, may be sick and unable to volunteer.

Barely half of hospitals, only **52.9 percent** of respondents, reported that their hospitals had plans in place to incorporate additional staff in the event of an emergency.

SURGE WORKFORCE FOR EMERGENCIES

The Surgeon General's Office and the Assistant Secretary for Preparedness and Response have been working to establish strong volunteer networks of medical professionals to help with emergencies and incorporating lessons learned during Hurricane Katrina.

The Surgeon General's Office manages the **Medical Reserve Corps (MRC)** as part of the national network of volunteers called the Citizen Corps to help with expert medical care surge capacity during times of emergency.[166] MRC's mission "is to improve the health and safety of communities across the country by organizing and utilizing public health, medical and other volunteers."[167] MRC volunteers include medical and public health professionals such as physicians, nurses, pharmacists, dentists, veterinarians, and epidemiologists. Across the country there are some 140,000 MRC volunteers linked with more than 700 units of the MRC as of November 2007.

MRC units are funded by the federal government, as well as by state and local governments, and in some cases through private funds such as foundations. In September 2006 the National Association of County and City Health Officials (NACCHO) signed a cooperative agreement with MRC to strengthen the ties between the MRC program at all levels and the nation's public health system. NACCHO will promote MRC to its members from local health departments and offer capacity development grants to new and existing MRC units.[168]

In addition to the MRC program, the Office of the Assistant Secretary for Preparedness and Response (ASPR) manages a state-based program designed to secure a volunteer healthcare delivery workforce in the event of an emergency.[169] **The Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP)** program helps states develop standardized programs for registering volunteer health professionals in advance of emergencies. Each state program collects verified information on the identity, licensure status, clinical privileges, and professional credentials of volunteers. State ESAR-VHP systems are intended to be the mechanism for recording the registration and credential information of all potential health volunteers in a state. They will provide a single, centralized volunteer information database to facilitate intra-state, state-to-state, and state-to-federal transfer of volunteers. These systems should include information about volunteers involved in organized efforts at the local level (such as the MRC units) and the state level. The system also will serve a critical statewide role in recruiting, registering, verifying credentials, and classifying health professionals willing to serve in emergencies but not interested in being part of a trained, organized volunteer structure.

By establishing ESAR-VHP registries in each state, ASPR hopes to eliminate the confusion and bureaucracy that hampered volunteer healthcare workers' efforts in New Orleans after Hurricane Katrina struck in August 2005. In one case, a 35-car convoy of some 100 healthcare workers from North Carolina was stopped at the Louisiana state line, where state officials refused to let them enter the state to treat persons affected by the storm and subsequent flooding.[170]

ASPR is actively working to accelerate implementation and operation of these state systems given that starting in FY 2009, participation in ESAR-VHP will be a pre-condition for receiving federal preparedness funds.[171]

CALIFORNIA'S SURGE INITIATIVE

California is no stranger to disasters. Earthquakes, wildfires, and floods are among the natural disasters that routinely strike the state. Perhaps it is not surprising, then, that California has emerged as a national leader in enhancing public health emergency preparedness for natural disasters, terrorist attacks, and disease outbreaks -- the all-hazards approach.

Over the past 2 years, California has invested $214 million to build emergency surge capacity for potential disasters in the state through the purchase of 2,400 ventilators, 50 million N95 respirators, 3 200-bed mobile field hospitals, and supplies and equipment for 21,000 alternate care site beds. The state has also bought its share of federally-subsidized antiviral medications (3.7 million courses). In addition, California is developing standards and guidelines for healthcare delivery during surge events, and is updating hospital emergency and infection control regulations.[172]

4. Vaccine Prioritization for Healthcare Workers

Survey participants were asked:
"Has your hospital worked with the state or local health department to plan for prioritizing hospital workers to receive health agency-managed vaccine or anti-infective therapy in the event of an infectious emergency?"

At the beginning of a major infectious disease outbreak, such as pandemic influenza, there is likely to be a shortage of vaccines and medications to cover the entire population. Priority setting to determine which segments of the population will receive scarce supplies based on potential risk is an essential component of public health preparedness.

The **majority of respondents (79 percent)** reported they had worked with state or local health departments to ensure that hospital workers would be on the priority list to receive vaccine or antivirals. Healthcare workers and hospital staff are prioritized high so that they remain healthy enough to keep the rest of society functioning.

2007 DRAFT PLAN FOR PANDEMIC VACCINE PRIORITIZATION

According to the U.S. Department for Health and Human Services, the groups to receive first doses of vaccine under a draft federal prioritization scheme are:

- 700,000 deployed and critical military personnel;
- 6.3 million public health, hospital, outpatient, home health and long-term care workers;
- 2.1 million emergency medical services, police and firefighters, vaccine and antiviral manufacturers, key government leaders; and
- 13.4 million pregnant women and babies 6 to 35 months old.[173]

Once more vaccine becomes available, older children, and utility and telecommunications workers could be added to the list.[174]

The draft plan was unveiled at an October 22-23, 2007 meeting of the National Vaccine Advisory Committee. While the plan is not yet finalized, the highest priority groups are unlikely to change.[175]

5. Infection Control Rapid Response

Survey respondents were asked: *"Does your hospital have an infection control professional available for an immediate (within 15 minutes) verbal consultation (via phone or face-to-face) on a 24 hour/7 days a week basis with the hospital or public health personnel?"*

According to the World Health Organization, 39 new diseases have been identified over the past 40 years, including HIV, Ebola, Marburg, and SARS. In addition, older diseases, such as malaria and tuberculosis, have mutated and developed drug resistance making them even harder to treat.[176] With airlines carrying more than 2 billion passengers a year, diseases can travel from one country to another in a matter of hours.[177] The devastation wrought by such disease outbreaks goes beyond the field of public health. For example, the 2003 SARS outbreak cost Asian countries an estimated $60 billion of gross expenditure and business losses.[178] A pandemic flu could cost the United States an estimated $683 billion.[179]

Enhanced disease surveillance, rapid diagnosis and rapid response capabilities are essential components of emergency preparedness. **More than three-quarters of respondents (78.4 percent)** reported that their hospitals have an infection control professional available for an immediate verbal consultation on a 24 hour/7 days a week basis with the hospital or public health personnel.

6. Stockpiled Medical Supplies

Survey participants were asked:
"Has your hospital taken specific steps to stockpile or have reserve medical supplies (including linens, gowns, masks, and other supplies) needed during an infectious disease emergency (such as through ordering or contracting over and above routine supply in the event that regular supply chain deliverables become unavailable)?"

The current U.S. hospital system relies on "just-in-time inventory" strategies, which could be problematic in the face of a public health emergency that could diminish the efficiency of the delivery system. Emergency planners, therefore, need to consider how they will obtain additional supplies in advance of an emergency from vendors, other healthcare facilities, and the state and federal governments.[180] **Nearly three-quarters (73.9 percent)** of hospitals have taken specific measures to stockpile or have reserve medical supplies (including linens, gowns, masks, and other supplies) that would be needed during an infectious disease emergency.

While a large majority of respondents indicated that their hospitals had taken specific measures to stockpile supplies, there were large differences in the types of goods they reported stockpiling. For instance, the number of respondents who indicated their hospitals had stockpiled surgical masks was 46.2 percent, while only 36.2 percent had stockpiled medical equipment, such as ventilators, and less than one-fifth (18.7 percent) had stockpiled linens.

A much larger percentage (66.7 percent) said their hospitals had stockpiled NIOSH-approved N-95 respirators. While much of what would be needed during a pandemic or other public health emergency will come from the SNS, 62.5 percent of respondents said their hospitals had stockpiled or made agreements for accessing additional supplies of medications in addition to what they will receive from the SNS.

OTHER PREPAREDNESS TRAINING RELATED FINDINGS FROM THE 2007 APIC SURVEY

- 87.5 percent of hospitals participated in bioterrorism or infectious disease exercises in the past year.
- Of this group, 72.7 percent reported the exercise involved **community participation**.
- 84.9 percent of hospitals compiled **'lessons learned'** from the exercises that were later used to revise emergency response plans.
- Only 64.1 percent of these hospitals, however, then **trained/educated** hospital staff on the revisions made to the emergency response plan.
- Just under a quarter (24.8 percent) of hospitals have "cross-trained" staffers to provide **patient care** outside their routine area or specialty, in case staffers are re-assigned to primary care settings during disaster response.


Use
BIOHAZARD

U.S. Public Opinion Poll

SECTION 4

Americans have little confidence in preparations to handle a variety of potential threats or public health emergencies at national and local levels. A survey commissioned by TFAH found that, 6 years later, more than half of all Americans believe the country is less safe now than before the terrorist attacks of September 11, 2001.

While people believe they share a responsibility with government to make sure they can handle a natural disaster or public health emergency, many indicate they have not taken necessary steps to ensure their homes and families are ready for such an event. A lack of concrete plans for communicating and planning with family members stands out as a primary area where improvement in preparedness is needed.

The survey was designed and conducted by Greenberg Quinlan Rosner Research, Inc. Interviews were conducted by professional interviewers. The survey reached 1,020 adults ages 18 and older. The survey was conducted October 18-22, 2007. The data were weighted by gender, age, race, and region to ensure an accurate reflection of the population. The sample size with these weights applied is 1,020 and is subject to a margin of error of +/- 3.1 percent at a 95 percent level of confidence.

The following are key findings from the survey, followed by a more in-depth analysis.

- Fifty-four percent of Americans believe the United States is less safe than prior to September 11, 2001.
- People express little confidence in preparedness for emergencies. Large majorities of Americans indicate the country and their communities are not adequately prepared to handle a large scale natural disaster like Hurricane Katrina, a bioterrorism attack, or a pandemic flu.
- Americans recognize they have little control over large-scale potential disasters and public health emergencies, but remain concerned about the possibility of such threats. Past research showed that Americans tend to avoid thoughts of issues they see as beyond their control, like public health threats of all forms, instead relying on government's ability to handle these issues. Americans still express worry, however, about these crises and think more must be done to prepare for them. Some of the most vulnerable segments of the population, including older women, African Americans, and Hispanics, express even greater worry about each of these threats.
- While 82 percent of adults see preparing for natural disasters and public health emergencies as a shared responsibility between government and individuals and families, many have not taken steps to be prepared in their own homes. Four-in-ten Americans do not currently maintain a 2-week reserve of food, water, and medical supplies to ready themselves for an emergency. In addition, majorities of Americans have no plan for communicating or reuniting with family members if separated during an emergency event.

1. AMERICANS SEE THE COUNTRY AS LESS SAFE NOW THAN BEFORE 9/11

Just 44 percent of American adults believe the United States is safer now than before the terrorist attacks of September 11, 2001 while a majority (54 percent) say the country is not as safe as it was prior to September 11. While large blocs of nearly every demographic group indicate the nation is not as safe, there are some differences across gender, age, racial, and geographic boundaries.

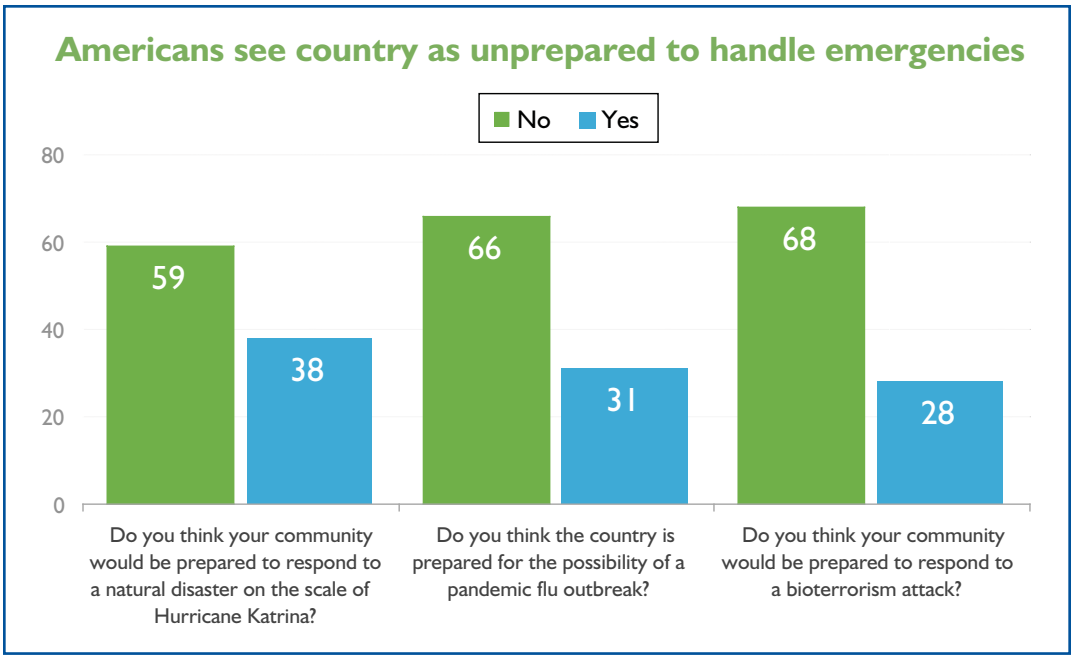
- **African Americans are least likely to believe the country is safer now.** Nearly three-quarters of African Americans say the United States is not as safe now as it was before 9/11, compared to 55 percent of Hispanics and 52 percent of whites.
- **Women are more likely than men to question the level of safety in America.** Fifty-eight percent of women believe the country is less safe than before 9/11, while the same metric reads 50 percent for men. College-educated women (66 percent) and women over the age of 50 (60 percent) are among the least likely to believe the country is safer now.
- **Belief in country's safety rises as income increases.** Americans making more than $75,000 a year or more are most likely to think the country is safer now than 6 years ago. Even among this group, however, just a bare majority believes this.
- **Majorities of Americans in every region indicate the country is less safe now, but those living in the South are most confident in the current level of safety in the country** (regional definitions are provided in Appendix K).

Is America Safer Than Before September 11, 2001?

	%Yes	%No
Total	44	54
White	46	52
African-American	27	73
Hispanic	45	55
Men	48	50
Women	40	58
Northeast	40	56
Central	43	56
South	47	51
West	44	55
Less than $30,000/yr household	39	60
$30,000-$50,000/yr household	42	56
$50,000-$75,000/yr household	49	50
More than $75,000/yr household	50	48

2. PEOPLE EXPRESS LITTLE CONFIDENCE IN PREPAREDNESS FOR NATURAL DISASTERS, OUTBREAKS OF DISEASE, OR TERRORIST ATTACKS

Not only do people feel less safe than they did previously, but they also believe the country and local communities are unprepared for emergencies on a number of fronts. Fifty-nine percent say their communities would not be ready to deal with a large scale natural disaster similar to Hurricane Katrina, while 68 percent believe their communities would not be prepared to handle a bioterrorism attack. Sixty-six percent of Americans believe the country is not prepared for an outbreak of pandemic flu.



As with the view of the country's overall safety, women are less likely to believe that the country and their communities are prepared to address these public health emergencies. Minority populations – including both African Americans and Hispanic adults – also express less belief in the country's preparedness to respond to these situations.

3. AMERICANS EXPRESS CONCERN OVER HEALTH THREATS THEY VIEW AS BEYOND THEIR CONTROL

The possibility of terrorist attacks, natural disasters, or other health crises is overwhelming to many Americans, and they look to government to ensure communities are equipped to deal with these large-scale issues. They continue to express concerns, however, about the possibility of these events occurring. On average, Americans rate their level of worry about specific disasters between a 4.2 and a 5.3 on a 0 to 10 scale. The highest level of worry comes in connection to food contamination (average 5.3 on a 0 to 10 scale), a threat that touches everyday living.

Level of worry about specific threats	
	Average rating on a 10 point scale
Food contamination, like the recent *E.Coli* outbreaks in ground beef	5.3
A pandemic flu outbreak	4.9
A new major disease outbreak, like the drug-resistant strain of Tuberculosis	4.8
A biological or chemical terrorism attack	4.8
A natural disaster, like Hurricane Katrina	4.2

Some of the most vulnerable Americans, including older women, African Americans, and Hispanics, express greater worry about each of these threats than other Americans do. A huge divide also exists on a socioeconomic level, as Americans with only a high school education are far more likely to express concern about these events than their college-educated counterparts. In nearly every case, the number of high school graduates who rate their level of worry as an 8 or higher on the 10-point scale is more than double that of college graduates.

Worry about specific threats decreases with education level (% extremely worried -- those rating 8 or higher on a 10-point scale)				
	Total	High School	Some College or less	College graduates
Food contamination, like the recent E.Coli outbreaks in ground beef	28	38	28	19
A biological or chemical terrorism attack	25	36	25	16
A pandemic flu outbreak	21	32	21	13
A new major disease outbreak, like the drug-resistant strain of Tuberculosis	21	26	24	15
A natural disaster, like Hurricane Katrina	19	29	14	14

4. PARENTS INDICATE A HIGH LEVEL OF CONFIDENCE IN THEIR SCHOOLS AND CHILDREN'S PREPAREDNESS

Americans who have a school-age child overwhelmingly believe that their child's school has a plan in place to handle an emergency. Eighty-eight percent say such a plan exists and just 12 percent say the school either does not have a plan (6 percent) or that the parent is uncertain about the plan (6 percent).

Parents also are confident their children are adequately prepared to handle emergencies. Six-in-ten adults with school-age children say their child knows what to do in case of a public health emergency, while 37 percent say their children are not prepared for such an event.

5. BELIEF IN A SHARED RESPONSIBILITY ON PREPAREDNESS DOES NOT LEAD TO ACTION TO ENSURE PREPAREDNESS AT HOME

Americans see preparing for natural disasters and public health emergencies as a universal issue that both government and individual Americans must work on together. Eighty-two percent of adults think it is a shared responsibility, compared to just 10 percent who say the responsibility for preparation for emergencies should lie primarily with individuals, and 8 percent who task government with primary responsibility.

Despite this desire to share responsibility, however, many Americans have not taken the necessary steps to ensure they and their families are ready for a catastrophe. Americans are most likely to have stockpiled two weeks worth of food and water supplies (59 percent) and prescription and over the counter medications (58 percent).

At the same time, less than half of Americans say they have made plans for reuniting with other family members if separated during an emergency (46 percent), and just 45 percent of adults have an alternate plan to communicate with family members if cell phone service is unavailable during an emergency.

Some trends emerge:

- Americans under the age of 50 are much less likely their older counterparts to have stashed food and medical supplies in their homes in case of emergencies. This is particularly true of prescription and over the counter drugs; two-thirds of Americans over 50 maintain a two-week supply in their homes, while just under half (49 percent) of those under the age of 50 have stockpiled adequate amounts of medicine.
- Americans with less than a college education (55 percent) are less likely than college-educated Americans to keep an emergency supply of medications in preparation for an emergency (64 percent).
- Those living in the Southern and Western regions of the country are more likely than Americans in the Northeast and Central parts of the country to have plans to communicate and reunite with their families if an emergency should occur.

Americans living in the Southern and Western regions most prepared to communicate with families in an emergency (% answering yes)

	Northeast	Central	South	West
Does your family have a plan for reuniting if you become separated due to an emergency?	41	44	49	47
If cell phone service is unavailable due to a catastrophic emergency, do you have a backup plan to communicate with your family?	42	37	49	49

6. AMERICANS WOULD SUBMIT TO QUARANTINE DURING A PANDEMIC FLU OUTBREAK

Nearly 9 out of 10 Americans say they would abide by a voluntary quarantine and stay home in the case of a pandemic flu. Willingness to accept this type of quarantine exists across the public at high levels. Among the 10 percent who say they would not adhere to the government's request of a voluntary quarantine, most indicate they could not stay at home due to fears of losing needed income (64 percent) or losing their jobs altogether (39 percent). *(Note: Results add to more than 100 percent as multiple responses were accepted.)* Fifty-four percent of those who would not remain at home indicate they work as essential personnel and would still be required to work.

Additional Issues and Concerns

SECTION 5

1. PUBLIC HEALTH WORKFORCE SHORTAGE

The public health workforce is facing a shortage of crisis proportions that seriously threatens our nation's health. As the workforce ages, an inadequate number of new public health professionals are coming into the system to replace them. A workforce shortage could debilitate the system if a public health emergency were to occur. According to a 2003 survey by the Association of State and Territorial Health Officials (ASTHO) and the Council of State Governments (CSG), in nearly half of the states, 25 percent or more of the state public health workforce will be eligible for retirement within the next five years.[181] *(Note: ASTHO expects to release an updated version of this survey in 2008)*.

The **2006 Pandemic and All-Hazards Preparedness Act (PAHPA)** included 2 programs to address the current public health workforce shortage, but neither program received any funding in FY 2007.

The first program is a **public health workforce demonstration project** that will recruit new employees to work in state health departments that provide a significant amount of service and care to underserved populations and/or work with communities vulnerable to a public health emergency. New employees agree to serve for a minimum of 2 years and, in return, the program pays back their student loans.[182]

The second program established under PAHPA is an expansion of the **public health workforce loan repayment program**, which awards monies to states to operate their own loan repayment programs and attract more employees into public health careers.[183]

Both programs fall under HRSA's National Health Service Corps (NHSC), a 37-year-old program initially created to address the healthcare worker shortage in rural areas. Over the years the NHSC has expanded its focus to included underserved urban neighborhoods as well. Currently, there are over 4,600 NHSC clinicians working in rural and urban communities nationwide, serving 5 million people.[184]

In 2007, U.S. Senators Charles Hagel (R-NE) and Richard Durbin (D-IL) introduced the **Public Health Workforce Development Act** to help address the workforce crisis. This bill aims to widen the pipeline of qualified public health workers at all levels -- federal, state, local, and tribal -- by offering scholarships and loan repayment as recruitment and retention incentives for students who enter and stay in the field of public health. The bill also provides opportunities for mid-career public health professionals to go back for additional training in public health preparedness or biodefense. This was the third year that Senators Hagel and Durbin introduced the bill; however, as of November 2007, no action was taken.

Nursing Shortage

As one example of the impending public health workforce shortage crisis, the federal government estimates that by 2020 nurse retirements will contribute to a shortage of nearly one million nurses.[185] According to the American Hospital Association, the current national hospital nurse vacancy rate is 8.5 percent. There are several factors behind the present and future nursing shortages, including increased job opportunities for nurses outside of traditional healthcare settings and the impending retirement of tens of thousands of nurses coupled with an increased demand for healthcare among the Baby Boomer generation.[186]

Currently, hospitals facing a workforce shortage rely on temporary nurses or international recruitment of nurses and doctors to meet their staffing needs. In 2005, 13 percent of all newly licensed nurses were international nursing graduates.[187] Relying on temporary nurses and international recruits, however, is not a long-term solution. Instead, experts recommend a more sustainable long-term approach including:

- Changing the current healthcare model so that nurses are valued more;
- Improved working conditions in terms of merit-based pay and seniority-based pay, flexible schedules, and more respect from patients and medical staff;
- Public-private partnerships to encourage nurses to stay in the workforce and to boost numbers of nursing faculty; and
- Improved technology-based training for nurses.[188]

Public Health Workforce in Action

August 2007 -- Minneapolis Bridge Collapse

The Interstate 35W bridge collapse in Minneapolis during the evening rush hour on August 1, 2007 left 13 people dead and sent more than 100 people to hospital emergency rooms that night. Despite the fatalities, the city and county response to the disaster is seen as a model for how first responders and emergency medical personnel should act. According to the paramedics' supervisor at Hennepin County Medical Center, all injured people were transported to area emergency rooms in under 2 hours.[189] Minneapolis Mayor R.T. Rybak attributed the quick response to the city's investment of some $50 million since 2001 in emergency preparedness, specifically, enhanced communication technology.[190] It is unclear whether Minneapolis would be able to scale up this successful operation to respond to a larger mass casualty event.

August/September 2005 -- Hurricanes Katrina and Rita

The hurricanes that struck the Gulf Coast in August and September 2005 left some 1,900 people dead and caused upwards of $100 billion in damages.[191] In response to the devastation, the U.S. Public Health Service Commissioned Corps carried out the largest deployment in its history, deploying some 2,119 Corps officers to the region between August 26 and November 7, 2005. Of these officers, 81 percent served on teams that provided healthcare and other services directly to the affected communities, while 19 percent served on emergency response teams or at local operations centers.[192] The Commissioned Corps is a uniformed service comprised of some 6,000 public health professionals who fill essential leadership and service roles with the U.S. government. During health emergencies, the Corps is called upon to travel throughout the nation and world offering assistance.[193]

> *"As a rapidly deployable force of experienced health professionals, the Commissioned Corps of the U.S. Public Health Service has a leadership role in crisis response. But living up to its promise means the federal government must live up to its promises, including adequate tools and resources and a manpower increase of at least 10 percent."*
>
> --Gerard M. Farrell, Captain, USN (Ret.), Executive Director,
> Commissioned Officers Association of the U.S. Public Health Service

2. VULNERABLE POPULATIONS AND EMERGENCY PREPAREDNESS

In emergency preparedness "at-risk individuals," "vulnerable populations," and "special needs populations" are terms often used interchangeably to characterize groups whose needs are not fully addressed by traditional health and social service providers. They include people with physical and intellectual disabilities, limited or non-English speakers, persons who are geographically or culturally isolated, substance abusers and addicts, people who live in poverty or rely on public assistance, people without private transportation or who rely on public transportation, the homeless, the elderly and children.

As the tragic events of Hurricane Katrina demonstrated, ignoring the needs of vulnerable populations can have dire consequences. It was mainly the poor residents of the city of New Orleans who were unable to evacuate due to limited funds and lack of transportation. In addition, cultural barriers between low-income, minority residents and public officials contributed to the disaster.[194]

The 2006 PAHPA legislation, drafted in the wake of Hurricane Katrina, specifically states that the secretary for Health and Human Services is to take the needs of 'at-risk individuals' into consideration when managing preparedness programs such as the SNS and federal grants to states. The legislation does not, however, specify how the secretary nor additional authorities are to accomplish this.

CDC's Centers for Public Health Preparedness program sponsors a Vulnerable Populations Collaboration Group that is tasked with identifying, reviewing and highlighting preparedness education and information resources targeting special needs populations. The review, initially due out in 2007, is now scheduled to be published in early 2008.[195]

A review of 3 decades of literature on public health emergency preparedness and vulnerable populations by Dennis Andrulis and colleagues at the Center for Health Equality at Drexel University yielded the following recommendations:

- Tailor public health and risk communication messages for vulnerable populations and use trusted messengers and appropriate channels;
- Ensure public health training includes disaster scenarios in at-risk populations' neighborhoods. For example, evaluate how emergency responders would react to an event in a neighborhood of primarily Spanish-speaking residents;
- Improve coordination among federal, state and local resources. The complexity of problems faced by special needs populations requires a multi-faceted response; and
- Engage community organizations and key leaders from the at-risk communities to fully incorporate their perspectives and needs into emergency planning and response.[196]

3. CARING FOR CHILDREN DURING DISASTERS

Planning to care for the nation's 73.6 million children and adolescents during a public health emergency presents complex considerations and challenges. Children are not "small adults" and special consideration needs to be given to complicated issues ranging from child-appropriate doses of medications and vaccines to caring for children if schools and childcare facilities are closed for extended periods. Parents and other caregivers may also become sick or injured during a disaster, complicating their ability to care for children.

Special Pediatric Considerations in Terrorism and Disaster Preparedness

Columbia University's National Center for Disaster Preparedness has identified the following issues of concern:

- Children are more vulnerable to chemical agents that are absorbed through the skin or inhaled;
- Children have special susceptibilities to dehydration and shock from biological agents;
- Children can not be decontaminated in adult decontamination units;
- Children require different dosages or different antibiotics and antidotes to many agents;
- Children are more susceptible to the effects of radiation exposure and require different responses than adults;
- Children have unique psychological vulnerabilities, and special management plans are needed in the event of mass casualties and evacuation;
- Emergency responders, medical professionals, and children's health care institutions require special expertise and training to ensure optimal care of those exposed to chemical, biological, or nuclear agents;
- Children's developmental ability and cognitive levels may impede their ability to escape danger; and
- EMS, medical, and hospital staff may not have pediatric training, equipment, or facilities available.[197]

Children and Pandemic Influenza

A joint report by TFAH and the American Academy of Pediatrics found that current pandemic preparedness does not fully account for the special needs of children.[198] The gaps in planning identified by the report include:

- There are currently only 6,000 regimens of pediatric antiviral suspension in the Strategic National Stockpile (SNS) to treat a potential flu pandemic for the nation's 73.6 million children.[199] For planning purposes the federal government has assumed that antivirals would be needed for at least 25 percent of the population. However, government officials have not set any target for pediatric antivirals **even though children and adolescents are known to often be disproportionately affected by contagious respiratory illnesses**.
- Neither of the 2 antiviral drugs that have been shown effective against H5N1 is licensed for children younger than one year.
- CDC recommends the public consider using N95 respirator masks in certain circumstances during a pandemic outbreak. N95 respirator masks, however, are not currently produced in children's sizes.
- Approximately 30 million children rely on the National School Lunch Program for meals each day and many rely on school nurses for health care. If schools were closed due to a pandemic, steps would need to be taken to ensure that children continue to receive these services.

School Emergency Plans

There are 17,000 school districts in the United States responsible for some 49 million public school students. Although no federal laws exist requiring school districts to have emergency management plans, the U.S. Government Accountability Office (GAO) reports that "almost all school districts have taken steps to prepare for emergencies."[200]

Other heartening findings from the GAO survey of state school districts include:

- 95 percent of all school districts have written emergency management plans with no statistical difference between urban and rural districts.
- 93 percent of all school districts conduct inspections of their school buildings and grounds to identify possible vulnerabilities in accordance with recommended practices.
- 87 percent of school districts that conduct physical plant inspections made security enhancements to their school facilities and grounds as a result of these inspections.
- A majority of school districts with written emergency plans include steps to assist with recovering from an incident, in accordance with recommended practices.

Troubling findings include:

- Roughly 75 percent of all school districts have not included written procedures in their plans for communicating with limited-English proficient parents and students.
- 28 percent of school districts with emergency management plans do not have specific provisions for special needs students in their emergency management plans.
- Few school districts' emergency plans contain procedures for continuing student education in the event of an extended school closure, such as a pandemic outbreak.
- Fewer than half of school districts with emergency management plans involve community partners such as the local head of government (43 percent) or the local public health agency (42 percent), when developing and updating their emergency management plans, as recommended by the U.S. Department of Health and Human Services (HHS).
- 27 percent of all school districts with emergency management plans have never trained any first responders on how to implement the plans.

Congressional Action

Senator Christopher Dodd (D-CT) and Congresswoman Corrine Brown (D-FL) have introduced bills to create the **National Commission on Children and Disasters**, a 10-member bipartisan panel of experts in child welfare, family services, emergency management, that would provide recommendations to plan for needs of children in disasters.[201] The Commission would: (1) assess facts and causes relating to the needs of children before, during, and after all public health emergencies; (2) evaluate existing laws relevant to such needs; (3) evaluate lessons learned from Hurricanes Katrina and Rita, the September 11, 2001 terrorist attacks, and any other relevant disaster of the past 10 years; and (4) report to the president and U.S. Congress. The Senate version also directs the secretary of Health and Human Services to establish a National Resource Center on Children and Disasters, which shall: (1) establish a clearinghouse for information and resources on issues relating to such needs; and (2) develop and maintain a website and related systems for disseminating information on such issues. As this report went to press, the Senate bill (S.1970) remained in committee while the companion bill (H.R. 3495) was approved by the House of Representatives in November 2007.

4. MENTAL HEALTH CONSIDERATIONS

The coordination and integration of mental health agencies' plans into disaster responses is a critical step for ensuring an effective and targeted response to all-hazard emergencies. Studies on emergency preparedness and mental health, however, reveal that such interagency coordination is severely lacking. In fact, "respondents felt less prepared for mental health issues than they did for preparedness issues in general."[202]

This is especially worrisome given that "the available research literature suggests that in disasters, individuals presenting acutely with psychologically-related complaints tend to outnumber those presenting with physical symptoms directly stemming from the injury-causing agent or event. This acute 'mental health surge' can rapidly overwhelm existing community mental health resources, especially in the context of terrorism."[203]

Mental Health and Hurricane Katrina

In the immediate aftermath of Hurricane Katrina in 2005, a CDC study found that half of adults surveyed in New Orleans exhibited levels of emotional distress, indicating a potential need for mental health services.[204] At the time of that survey, some 7 weeks after Katrina, the majority of respondents remained without basic public utilities and services such as water, electricity, gas, and garbage removal. Even now, some 2 years into the rebuilding and recovery process, calls to mental health hotlines remain high and psychiatrists report being overbooked due an increased demand for mental health services.[205]

A 2007 Harvard Medical School study supports the anecdotal evidence. Ronald C. Kessler, lead author of the study and professor of health-care policy at Harvard Medical School, told the *Washington Post* "it's really stunning in juxtaposition to what these kinds of surveys have shown after other disasters, or after people have been raped or mugged. Typically, people have a lot of trouble the first night and the first month afterward. Then you see a lot of improvement."[206] In this case, however, the Harvard scholars found that the number of Katrina survivors in New Orleans reporting signs of severe mental illness, suicidal thoughts and post-traumatic stress disorder **increased** between March 2006 and the summer of 2007.

An earlier Harvard study, part of the continuing examination into the after-effects of Hurricane Katrina on residents' health, found that mental health problems affected all segments of the community across racial, ethnic, and socioeconomic lines.[207]

A 2006 study from Columbia University's National Center for Disaster Preparedness found that children displaced by Hurricane Katrina were particularly vulnerable to mental health issues.[208] Children displaced by the storm were scattered around the country and often removed from their traditional safety net of extended family, friends, and educators. In the study, "nearly half of the parents surveyed reported that at least one child in their households had emotional or behavioral difficulties that he or she didn't have before the hurricane, such as feeling sad or depressed, being nervous or afraid, or having problems sleeping or getting along with others."[209]

5. ANTIMICROBIAL RESISTANT BACTERIA

Methicillin-Resistant *Staphylococcus aureus* (MRSA)

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a form of the common staph bacteria that has mutated and become resistant to certain first-line antibiotics such as penicillin. While MRSA frequently lives on the skin and in the nose of humans without causing any harm, if the bacteria enters the body through a cut, or if the person's immune system is compromised by the flu or other causes, a MRSA infection can set in. According to a recent CDC report, there are some 94,000 invasive MRSA infections in the U.S. each year, and some 18,000 deaths were attributed to these infections.[210]

In October 2007, a rash of non-hospital MRSA cases was reported in the Washington, D.C. metro area, including the death of one high school athlete as a result of the super bug. This news prompted officials to take extreme measures such as closing schools and sports facilities for disinfection.[211] Health experts, however, say simple measures such as proper hand washing techniques, covering open wounds with clean bandages, and not sharing personal items such as towels and razors, can help protect people.[212]

Multi-Drug Resistant Tuberculosis (MDR-TB)

According to the World Health Organization, one-third of the world's population is currently infected with the Tuberculosis (TB) bacillus and some 1.6 million deaths were attributed to TB in 2005.[213] While many people infected with TB have no symptoms and may not be contagious, those who have an active form of TB can easily spread the disease to others through coughing, sharing of utensils, and other forms of close contact.

A dangerous development in the battle against TB has been the spread of MDR-TB. This strain is resistant to at least 2 of the best anti-TB drugs, isoniazid and rifampicin, and has spread rapidly over the past 10 years, mainly because people fail to follow doctors' orders to take their TB medicines properly and finish the course of the drug therapy.[214] Extensively drug-resistant tuberculosis (XDR-TB) is an even more drug-resistant form with a cure rate of approximately 30 to 50 percent.

While cases of MDR-TB and XDR-TB are relatively infrequent in the U.S. (less than one percent of cases), they are a serious public health threat.[215] According to CDC, "while drug-resistant TB is generally treatable, it requires extensive chemotherapy (up to 2 years of treatment) with second-line anti-TB drugs that are more costly than first-line drugs, and which produce adverse drug reactions that are more severe, though manageable."[216] According to Kenneth Castro, the U.S. Assistant Surgeon General and Director of CDC's Division of Tuberculosis Control, in-patient costs alone for XDR-TB can average $500,000 per case, while the cost of treating MDR-TB is about $2,500.[217] The cost of treating regular TB is a few hundred dollars.[218] The added cost of treating MDR-TB and XDR-TB may be too much for burdened public health systems in developing countries. The WHO has appealed to the world's wealthiest nations for a 4-fold increase in anti-TB funding to address the problem.

Recommendations

SECTION 6

Overall, this report finds that that significant progress has been made in the nation's preparedness to respond to public health emergencies based on measures where state-by-state data are available. Yet significant work remains on critical issues of preparedness such as surge capacity, legal protections for health care volunteers, and eliminating geographic disparities in vital areas such as stockpiling antivirals for a flu pandemic or plans to distribute emergency supplies from the Strategic National Stockpile. Above all, progress is threatened by diminishing federal support to states and localities for their preparedness activities.

Important progress has been made since the September 11, 2001 and anthrax tragedies, and, in the past year, the passage of the 2006 Pandemic and All-Hazards Preparedness Act (PAHPA) and updated federal directives were important milestones in the effort to protect the American people from major health disasters. TFAH applauds the U.S. Congress for enacting the PAHPA legislation and addressing many concerns raised in previous versions of the *Ready or Not?* reports. PAHPA sets clear goals toward building an all-hazards approach to public health emergency preparedness.

The passage of the legislation, however, does not mean the changes called for have been achieved. In fact, this report shows delays in the implementation of many of the specified measures, and a continued lack of accountability for ensuring the measures are being carried out. In addition, without increased investment and political prioritization, even basic improvements needed are unlikely to be achieved. Americans deserve basic protections in the event of health emergencies, and, right now, many of these protections are lacking, leaving Americans vulnerable to unacceptable levels of risk.

At the state level, there has been significant progress in some areas of preparedness, including critical laboratory capacity and development of pandemic preparedness plans, but significant work remains in such areas as surge capacity, and legal protections for volunteers working during emergencies. Moreover, because the capacities and efforts of states are not transparent – so little data are shared about what states are doing to meet federal objectives of preparedness – taxpayers, state legislators, and the U.S. Congress find it increasingly difficult to assess the return on their investment in preparedness.

To further strengthen emergency preparedness, TFAH recommends action across the following key areas:

1. Transparency, accountability and oversight;
2. Funding;
3. Surge capacity;
4. Public health workforce;
5. Research and development;
6. Legal reforms;
7. Health and sick leave benefits;
8. Food safety reforms;
9. Community resiliency.

1. RECOMMENDATIONS FOR STRENGTHENING TRANSPARENCY, ACCOUNTABILITY, AND OVERSIGHT

The Pandemic and All-Hazards Preparedness Act of 2006 not only demonstrated the resolve of the U.S. Congress and the Bush Administration to continue to address public health emergency preparedness, but gave the federal agencies, namely HHS, a series of deliverables and deadlines to produce and meet. A November 2007 report from the Office of the Assistant Secretary for Preparedness and Response detailed the progress made to date in implementing PAHPA. While TFAH applauds the action already taken, especially in light of personnel and funding constraints, much remains to be done. To ensure HHS fully complies with PAHPA and does so in an open and transparent manner, pursuant to the provisions of the statute, **the U.S. Congress should use its oversight powers to ensure full implementation and execution of PAHPA.**

Recommendations for Strengthening Oversight and Accountability	
Publish regular progress reports on the implementation of PAHPA	HHS should regularly provide publicly available updates on the progress made on benchmarks and deliverables under the PAHPA statute.
Develop new evidence-based benchmarks and objective standards	In coordination with the research community and evaluation specialists, the new objectives must be designed to gauge how well states respond to major public health emergencies. The objectives should focus on outcome results from real-life drills and exercises. Benchmarks currently in use are more process-oriented and not clear predictors of how well a state will respond to an emergency.
Incorporate lessons learned into future planning	The use of real-life exercises and drills, in addition to table-top exercises, gives states the ability to accurately gauge how well they would perform in a public health emergency. The lessons learned from these evaluations, however, are only useful if they are demonstrably incorporated into revised and updated preparedness plans.
Collect performance data; assess the results; and, annually release the findings publicly on a state-by-state basis	As required by PAHPA, HHS is in the process of developing a standardized reporting form for all states and hospital grantees. The use of this form will allow HHS to rate the performance of the grantees and to assure the proper expenditure of funds. Data from this form and other evaluations of states' emergency preparedness should be reported yearly on a state-by-state basis. This allows Americans to appropriately assess their states' progress and document how states have used taxpayer-supported preparedness funds.
Link performance with funding	Performance measures related to public health emergency preparedness and pandemic preparedness should be linked to future receipt of federal preparedness grants. HHS is developing guidelines for funds to be withheld from awardees that fail to meet the benchmarks, performance measures, and plans for responding to **pandemic influenza**. TFAH recommends completion and distribution of these guidelines in time for the FY 2008 awards. HHS should develop a similar set of guidelines for funds to be withheld for failure to meet **public health emergency preparedness** benchmarks and objectives. The federal government and the American taxpayer should be able to see demonstrable results after 6 years and billions of dollars in funding.
Transparency	The federal government, in collaboration with the states, should share states' pandemic preparedness plans and performance grades with the public to increase transparency and build community resiliency. CDC, specifically, should share the states' Strategic National Stockpile Technical Assistance Review scores on a state-by-state basis, in addition to releasing the specific grading criteria it uses for awarding points, and providing the public a basis for interpreting these scores. The more people know about state and local preparedness, the better equipped they are to make their own family and household plans.
Continuous revision and strengthening of preparedness plans	Federal and state agencies need to keep preparedness plans updated to account for changes in the environment and advancements in scientific knowledge.
Clear, streamlined leadership	National emergency response plans, such as the *National Strategy for Pandemic Influenza* and the *National Strategy for Public Health and Medical Preparedness,* should clearly designate the official in charge of public health preparedness and specify how various departments, state and local officials, and first responders are to collaborate in the event of a public health emergency.

2. FUNDING

The federal government should provide consistent, predictable, and sustained funding for preparedness activities to state and local health departments, including funding for activities in the event of a pandemic flu. Public health preparedness is a shared responsibility between the federal government and the states. State-generated revenues invested in public health should, therefore, increase as well. As demonstrated in this report, federal funding has been inconsistent – limiting the ability of states to build the kind of response capacity that is needed to be prepared for everything from a pandemic to natural disasters to terrorist attacks. The variation in critical state investment in public health also reflects a significant variation in capacity geographically. Where a person lives should not determine how well protected he or she is.

Recommendations for Funding	
Fully fund public health emergency preparedness activities	Programs dedicated to bioterrorism and public health emergency preparedness capabilities, specifically programs intended to support upgrading state and local capabilities and hospital readiness, **should be restored to FY 2005 levels of $919 million**. These funds are used to develop core boots-on-the-ground support for disaster response and any reduction in funding leaves the country at unnecessary levels of risk.
Increase pandemic influenza funding	The U.S. Congress **should fund pandemic preparedness at $1.2 billion**, the level set by the president's FY 2008 budget request.
Provide a transparent accounting of pandemic influenza funding	Nearly $5 billion of FY 2006 pandemic influenza funding was designated as 'no-year funding,' meaning HHS was able to spend that money as needed over the next several years. This approach enables HHS to contract with pharmaceutical manufacturers to advance the development of new-line vaccines and medications and bolster production capacity over several years. **According to the House of Representatives' Conference Report 410-124 accompanying H.R. 3043, however, $1.8 billion in appropriated funds for pandemic influenza have not been spent.** HHS should provide a clear plan for how the remaining funds will be spent.

3. SURGE CAPACITY

Surge capacity remains the largest threat to the nation's ability to respond to a major catastrophe such as a pandemic influenza. Although Congress has significantly increased federal funding to improve state and local and hospital emergency preparedness since 2001, much remains to be done to ensure that the U.S. healthcare system is able to function in a mass-casualty event.

Recommendations for Surge Capacity	
Regional coordination of healthcare facilities, including alternative care sites, with public health and emergency management	Hospitals, local health departments and emergency management agencies should build regional consortiums to organize and plan for public health emergencies. Such regional collaboration can lead to more efficient use of resources among hospitals and health departments, including personnel, and facilitate the sharing of promising practices. (Regional efforts could be within a locality or across county and/or state lines depending on the size of the communities involved.)
Alternative care sites	Despite the clear need for alternative care sites following a mass casualty event, there are several barriers to their successful roll-outs. To address these barriers, TFAH recommends the following measures: 1) Increase local, state, and regional planning with clear delineation of responsibilities and authority; 2) Foster public-private partnerships among healthcare practitioners; 3) Employ operational drills to test the deployment of mobile units and the creation of alternative care sites; and, 4) Address licensing and liability concerns for healthcare workers and volunteers and liability concerns for non-healthcare volunteers and third-party entities that play host to alternative care sites. In addition, emergency planners will need to obtain, stockpile, and store supplies, equipment and medicines for use in the alternative care sites.
Enhance communication systems	Hospitals must develop communication systems that allow healthcare facilities and public health departments to talk to each other and collectively manage an emergency response.
Designation of a disaster coordinator for each hospital	Strong leadership is essential to mounting and sustaining a successful public health emergency response at the national, state, and local levels. This applies to hospitals as well, which should designate a strong leader, respected and trusted by staff, to serve as a disaster coordinator. The person who fills this role will be required to assure that many difficult decisions are made, including the use of altered standards of care, alternate care sites, limited resources, and the call-up of volunteer medical personnel.
Surge workforce	Barely half of U.S. hospitals have plans in place to incorporate additional staff in the event of an emergency, and less than half report having incentives or provisions to encourage health care workers to report to work in the event of a mass-casualty event or major infectious disease outbreak. Public and private healthcare organizations should develop means to boost staff during a public health emergency, either through the use of incentives for current staff or through the use of volunteers or non-traditional staff, such as emergency medical technicians and medical and nursing students. The surge workforce should be recruited in advance in order to ensure licensing and accreditation issues are resolved before an emergency strikes.

4. PUBLIC HEALTH WORKFORCE

The growing workforce shortage in the health care and public health fields threatens U.S. emergency preparedness. America's response will be severely limited unless the workforce challenges the public health system faces are addressed. PAPHA contained 2 key provisions related to workforce development whose implementation TFAH supports. But much more remains to be done to address the public health workforce crisis.

Recommendations for Public Health Workforce	
Fund and implement PAHPA workforce provisions	The U.S. Congress should appropriate and allocate the necessary funds to implement the HHS demonstration project. The student loan repayment project is intended for individuals who: 1) are eligible for the National Health Service Corps loan repayment program and 2) also agree to serve in a state health department that provides service to a significant number of health professional shortage areas or has areas that are at risk of a public health emergency. The U.S. Congress should also appropriate and allocate monies necessary to execute the second PAHPA workforce provision, which allocates grants to states to assist in operating state loan repayment programs.
Enact and fund comprehensive public health workforce scholarship initiatives	The U.S. Congress should establish and fully fund public health workforce scholarship and loan repayment programs as recommended by the American Public Health Association.[219] Such initiatives should include financial incentives that will assist in recruiting and retaining public health professionals. It is essential this nation has in place a workforce not only qualified to conduct important ongoing surveillance and monitoring activities but also has sufficient capacity to be able to immediately respond to public health emergencies.
Renewed investment in HRSA's Public Health Workforce Development programs	The FY 2008 funding request for this program was **zero**, a $7.9 million decrease from FY 2007. **Congress should restore the FY 2003 program level of $10 million or more in FY 2009**. HRSA's Public Health, Preventive Medicine, and Dental Public Health Programs award grants to eligible entities to support the education and training of the public health workforce to deal with anticipated and new problems, with emphasis on placing public health professionals, preventive medicine specialists, and public health dentists in medically underserved areas, and improving the racial and ethnic diversity in the workforce.[220] Reinvesting in these programs would strengthen and diversify key public health workforce positions.
Expand HRSA's scholarship and loan repayment programs for registered nurses	The U.S. Congress should increase funding for HRSA's Nursing Scholarship Program and the Nurse Education Loan Repayment Program (NELRP). According to HRSA's own estimates, by 2020 nurse retirements will contribute to a shortage of nearly one million nurses.[221] Yet, in the most recent Nursing Scholarship Program application cycle, HRSA only accepted 172 of the 11,225 applicants, a rejection rate of 98.5 percent.[222] At the same time, HRSA rejected 85 percent of all applicants to the Nurse Education Loan Repayment Program. HRSA received 4,222 eligible applications and only made 373 initial (2-year) awards and 242 amendment (3-year) awards.[223] Both programs would do much to bolster nursing staff numbers in critically underserved areas.
Expand internship and fellowship opportunities at federal health agencies, as well as state and local agencies	The federal government must not neglect its own public health workforce at federal agencies including HHS, CDC, NIH, and FDA, among others. The impending retirement of tens of thousands of federal government employees from the Baby Boomer generation threatens these agencies and the important work they do. Federal funding for internships, fellowships, and other training initiatives will not only help attract the next generation to the public sector, but help ensure that mid-career professionals remain in their federal government jobs. Similar efforts, with federal financial support, are needed to address the same challenges being experienced by state and local governments.
Streamline the registration and accreditation of emergency healthcare volunteers	The expansion of the Emergency System for Advance Registration of Volunteer Health Professionals (ESAR-VHP) and the mandatory participation in the program in order to receive preparedness funds is a major step in the right direction. HHS should integrate other healthcare volunteer systems such as the Medical Reserve Corps and the National Disaster Medical System into ESAR-VHP in order to eliminate confusion among participants. Healthcare volunteers enrolled in these systems should participate in federal, state and local emergency drills.

5. RESEARCH AND DEVELOPMENT

The basic technology and tools of public health need to be modernized. Too often front-line healthcare professionals are relying on outdated diagnostic tests and medications. As new tests and therapies are developed and older ones become obsolete, the Strategic National Stockpile (SNS) should be replenished.

Recommendations for Research and Development	
Enhance research and development of vaccines and public health technologies	Basic technology and tools of public health must be modernized to adequately protect the American people. This includes research and development of vaccines and new technologies; and improved chemical laboratory testing capabilities. Collaboration with the private sector as envisioned under BARDA and Project BioShield will be essential.
Bring BARDA online at full capacity	HHS should continue to press ahead with BARDA staffing. In order for BARDA to operate at full capacity, however, the U.S. Congress must substantially boost funding from FY 2008. In light of current capacity, TFAH urges the U.S. Congress to **fund BARDA at $500 million or more for FY 2009.** As BARDA builds its own capacity, funding levels should rise commeasurately.
Clarify requirements and deliverables under Project BioShield contracts	ASPR should coordinate with NIH, FDA and CDC to ensure future BioShield requests for proposals and procurement contracts for new countermeasures have clearly articulated requirements, expectations, and deliverables.
Replenish and augment the Strategic National Stockpile (SNS)	Ensure the SNS contains enough supplies and dosage recommendations for adults **and** children. In addition, future federal appropriations cycles must take into account the need to replenish currently stockpiled countermeasures that pass their expiration dates.
Complete purchases of antiviral medications	HHS should obligate the remaining $660 million for the purchase of antiviral medications. The 7 states that have not purchased any of their shares of subsidized antiviral medicines should work with state legislators to fund those purchases.
Expand the Shelf Life Extension Program	The U.S. Congress should extend the Shelf Life Extension Program to include states' antiviral medications.
Modernize disease surveillance systems	Every health department and health agency should be part of a 21st century surveillance system that meets national standards and is interoperable between jurisdictions and agencies to ensure rapid information sharing. Surveillance systems should be able to detect infectious disease outbreaks or a bioterrorist attack. Plans should ensure adequate laboratory surveillance of influenza and other infectious diseases, as well as testing for pathogens such as E. Coli, Methicillin-resistant Staphylococcus aureus (MRSA), and extensively drug-resistant Tuberculosis (XDR-TB).

6. LEGAL REFORMS

This report has identified several areas where the legal underpinnings of public health response must be modernized to reflect demands on and authorities needed by public health officials to respond to major threats to the public health. It is fortunate that, in many cases, model legislative approaches have been identified. It is critical that all states have consistent approaches and authorities.

Recommendations for Legal Reforms	
Liability protection	Liability concerns are a growing challenge to emergency preparedness officials. Volunteers and private entities have expressed reluctance to participate in response and recovery efforts for fear that their actions may make them liable. There are several steps to be taken to remedy this including: 1) the federal government should issue a clear ruling on what liability protections are offered to volunteers and third-party entities under the Stafford Act; 2) state legislatures should adopt the Uniform Emergency Volunteer Health Practitioners Act (UEVHPA) which has been approved by both the National Conference of Commissioners on Uniform State Laws and the American Bar Association; and 3) state legislatures should consider extending Good Samaritan liability protections to those non-healthcare volunteers and business and non-profit entities that provide emergency assistance.

7. HEALTH AND SICK LEAVE BENEFITS

A public health emergency will create financial hardships for individuals and the healthcare system. Because compliance with recommendations to seek immediate care and/or self-isolate or quarantine may be critical to containing the spread of influenza or a terrorist-introduced organism, TFAH believes the federal government should take steps to assure that lack of health insurance or sick leave do not prevent compliance with public health recommendations.

Recommendations for Health and Sick Leave Benefits	
Establish an emergency health benefit	The federal government should establish an emergency health benefit, which would allow hospitals and healthcare centers to keep functioning during a prolonged public health emergency, while not denying care to uninsured and underinsured individuals affected by the crisis.
Set up emergency sick leave policies and procedures	The federal government should clarify whether the Department of Labor's Disaster Unemployment Assistance Program as currently set up would cover workers without sick leave who self-quarantine in the event of a pandemic flu. The U.S. Congress should consider legislation that would require employers with 15 or more employees to offer a minimum of 7 paid sick days each year, to be used to deal with individual medical needs or to care for sick family members.
Assure the ability of individuals in public insurance programs to create stockpiles of medications, as recommended by CDC	The federal government should issue clarifying guidance to states that beneficiaries under Medicaid can fill prescriptions for a personal stockpile of routine medications in accordance with CDC guidelines. Similar directives should be applied to SCHIP, Medicare, and the Federal Employee Health Benefits Program.

8. FOOD SAFETY REFORMS

Reforms are needed to make the U.S. food safety system preventive instead of reactive.

Recommendations for Food Safety Reforms	
Unified and prevention-oriented statutory mandate and organizational structures	The U.S. Congress should enact legislation that paves the way for a single, unified food safety agency to carry out a prevention-focused, integrated food safety strategy, including mandatory implementation of preventive controls by producers and processors. The single food safety agency should include: FSIS; the food regulatory functions of FDA, including CFSAN, the Center for Veterinary Medicine, and the food portion of FDA's field resource; and the food safety aspects of EPA's pesticide program.
Increased resources for research, standard-setting, inspection and enforcement, and education	A modernized food safety system will require additional resources for (1) research and data collection on the incidence and causes of foodborne disease, new food safety technologies and prevention strategies, and consumer behavior, (2) setting food safety performance standards establishing a mandatory standard of care for preventing food safety problems, (3) inspection and enforcement to ensure standards are consistently met by both domestic and foreign producers and processors, and (4) food safety education of commercial food handlers and consumers.
Risk-based resource allocation	The federal government should direct its resources for food safety research, regulation, and education in the manner most likely to maximize reduction in foodborne disease. This would require repealing the current FSIS inspection mandate and substituting a modernized mandate for the entire farm-to-table food safety system that would ensure an adequate resource base for inspection, but require the inspection and other resources be applied in the manner most likely to contribute to disease reduction.

9. COMMUNITY RESILIENCY

Homeland Security Presidential Directive (HSPD 21) identifies community resilience as one of "the 4 most critical components of public health and medical preparedness," along with mass casualty care, mass distribution, and biosurveillance. The U.S. government defines "community resiliency" as the ability of a community to cope and recover from a disaster or public health emergency. A CDC-funded study states that, in order "for a community to be resilient, its members must put into practice early and effective actions, so that they can respond to adversity in a healthy manner."[224]

Taking this into account, preparedness plans need to consider the diverse needs of the U.S. population, in particular, "at-risk," "special needs," and "vulnerable" populations. Only by effectively reaching out to all segments of the U.S. population can the country appropriately be prepared to survive and overcome crises.

Recommendations for Strengthening Community Resiliency	
Engage communities in planning	Federal, state and local governments must engage communities in local emergency and pandemic planning. Too often emergency planners just look to their grantees and ignore other key stakeholders, such as volunteer organizations, religious organizations, and schools and universities. Planners must proactively approach these diverse groups and bring them to the table.
Communicating effectively with at-risk individuals	Federal, state, and local officials must design culturally competent risk communication campaigns that use respected, trusted, and culturally competent messengers. Current research and best-practices regarding emergency preparedness communication strategies for at-risk populations should direct the creation and dissemination of these messages.
Children are not small adults	Children are inherently vulnerable as they depend upon adults for food, shelter, supervision and guidance. As such, their needs should be taken into account in all public health emergency and pandemic preparedness efforts. Child advocates, such as teachers and pediatricians, should be consulted as plans are made. Preparedness plans should be clearly communicated to parents, schools, and daycare facilities.
Mental health considerations	Disasters have far reaching mental health consequences.[225] Federal and state emergency planners should, therefore, coordinate with mental health agencies to ensure effective response to all-hazard emergencies.

Appendix A:

CDC AND ASPR PREPAREDNESS GRANTS BY STATE

BIOTERRORISM FUNDING BY SOURCE AND YEAR								
		FY 2006				FY 2007		% Change
State	CDC	ASPR	Total	State	CDC	ASPR	Total	FY 06– FY 07
Alabama	$11,332,549	$7,154,927	$18,487,476	Alabama	$12,951,863	$6,330,289	$19,282,152	4.30%
Alaska	$5,176,673	$1,458,182	$6,634,855	Alaska	$5,838,752	$1,349,441	$7,188,193	8.30%
Arizona	$15,468,991	$8,753,827	$24,222,818	Arizona	$17,681,799	$8,317,173	$25,998,972	7.30%
Arkansas	$8,513,998	$4,531,309	$13,045,307	Arkansas	$9,389,729	$4,063,403	$13,453,132	3.10%
California	$54,396,954	$38,325,286	$92,722,240	California	$65,303,030	$34,106,620	$99,409,650	7.20%
Colorado	$12,343,549	$7,221,888	$19,565,437	Colorado	$14,009,943	$6,525,958	$20,535,901	5.00%
Connecticut	$9,872,607	$5,651,890	$15,524,497	Connecticut	$11,324,491	$4,943,121	$16,267,612	4.80%
Delaware	$5,511,936	$1,709,476	$7,221,412	Delaware	$9,898,128	$1,737,218	$11,635,346	61.10%
D.C.	$6,702,385	$1,823,510	$8,525,895	D.C.	$5,911,495	$1,581,970	$7,493,465	-12.10%
Florida	$34,945,845	$25,638,227	$60,584,072	Florida	$42,467,776	$23,432,938	$65,900,714	8.80%
Georgia	$19,557,241	$13,330,420	$32,887,661	Georgia	$23,156,267	$12,370,869	$35,527,136	8.00%
Hawaii	$6,130,741	$2,345,600	$8,476,341	Hawaii	$6,418,428	$2,129,653	$8,548,081	0.80%
Idaho	$6,389,623	$2,521,506	$8,911,129	Idaho	$6,637,005	$2,359,069	$8,996,074	1.00%
Illinois	$20,613,241	$14,951,481	$35,564,722	Illinois	$24,575,584	$13,163,842	$37,739,426	6.10%
Indiana	$14,502,083	$9,660,723	$24,162,806	Indiana	$16,965,990	$8,503,785	$25,469,775	5.40%
Iowa	$8,810,613	$4,846,845	$13,657,458	Iowa	$9,779,223	$4,280,453	$14,059,676	2.90%
Kansas	$8,724,480	$4,525,854	$13,250,334	Kansas	$9,548,745	$4,004,077	$13,552,822	2.30%
Kentucky	$10,860,671	$6,585,429	$17,446,100	Kentucky	$12,441,275	$5,832,130	$18,273,405	4.70%
Louisiana	$11,478,386	$7,139,266	$18,617,652	Louisiana	$13,243,220	$5,935,695	$19,178,915	3.00%
Maine	$6,321,437	$2,434,432	$8,755,869	Maine	$6,526,615	$2,175,388	$8,702,003	-0.60%
Maryland	$13,970,053	$8,645,984	$22,616,037	Maryland	$16,047,435	$7,619,177	$23,666,612	4.60%
Massachusetts	$15,512,606	$9,983,770	$25,496,376	Massachusetts	$18,039,563	$8,660,567	$26,700,130	4.70%
Michigan	$23,221,202	$15,395,465	$38,616,667	Michigan	$26,992,552	$13,298,463	$40,291,015	4.30%
Minnesota	$13,134,147	$7,983,328	$21,117,475	Minnesota	$15,591,574	$7,050,445	$22,642,019	7.20%
Mississippi	$8,738,914	$4,759,591	$13,498,505	Mississippi	$9,722,248	$4,189,754	$13,912,002	3.10%
Missouri	$14,402,196	$8,951,388	$23,353,584	Missouri	$16,566,343	$7,906,932	$24,473,275	4.80%
Montana	$5,616,551	$1,856,928	$7,473,479	Montana	$5,982,933	$1,697,530	$7,680,463	2.80%
Nebraska	$6,897,069	$3,067,393	$9,964,462	Nebraska	$7,324,390	$2,741,751	$10,066,141	1.00%
Nevada	$8,660,838	$3,818,014	$12,478,852	Nevada	$9,340,451	$3,663,636	$13,004,087	4.20%
New Hampshire	$6,252,371	$2,404,444	$8,656,815	New Hampshire	$6,447,504	$2,166,921	$8,614,425	-0.50%
New Jersey	$18,894,214	$13,269,518	$32,163,732	New Jersey	$22,337,726	$11,560,312	$33,898,038	5.40%
New Mexico	$8,351,763	$3,276,757	$11,628,520	New Mexico	$8,690,645	$2,977,887	$11,668,532	0.30%
New York	$24,409,091	$16,937,704	$41,346,795	New York	$28,874,622	$14,561,258	$43,435,880	5.10%
North Carolina	$17,877,794	$12,948,887	$30,826,681	North Carolina	$21,306,097	$11,727,581	$33,033,678	7.20%
North Dakota	$5,147,111	$1,435,800	$6,582,911	North Dakota	$5,839,560	$1,306,102	$7,145,662	8.50%
Ohio	$24,190,050	$17,397,207	$41,587,257	Ohio	$28,837,726	$15,050,914	$43,888,640	5.50%
Oklahoma	$9,732,169	$5,681,308	$15,413,477	Oklahoma	$11,101,950	$5,037,444	$16,139,394	4.70%
Oregon	$10,251,502	$5,767,951	$16,019,453	Oregon	$11,468,821	$5,191,530	$16,660,351	4.00%
Pennsylvania	$26,235,793	$18,776,677	$45,012,470	Pennsylvania	$31,306,870	$16,271,242	$47,578,112	5.70%
Rhode Island	$5,981,291	$2,089,651	$8,070,942	Rhode Island	$6,073,925	$1,853,432	$7,927,357	-1.80%
South Carolina	$10,852,835	$6,632,258	$17,485,093	South Carolina	$12,548,500	$5,978,140	$18,526,640	6.00%
South Dakota	$5,339,585	$1,630,322	$6,969,907	South Dakota	$5,878,521	$1,491,255	$7,369,776	5.70%
Tennessee	$13,759,228	$9,138,647	$22,897,875	Tennessee	$16,418,187	$8,155,520	$24,573,707	7.30%
Texas	$46,595,417	$33,177,278	$79,772,695	Texas	$56,222,601	$30,301,320	$86,523,921	8.50%
Utah	$8,023,438	$3,978,558	$12,001,996	Utah	$8,878,797	$3,732,769	$12,611,566	5.10%
Vermont	$5,144,876	$1,415,048	$6,559,924	Vermont	$5,843,658	$1,290,942	$7,134,600	8.80%
Virginia	$18,466,632	$11,387,068	$29,853,700	Virginia	$21,300,739	$10,189,048	$31,489,787	5.50%
Washington	$15,353,518	$9,562,647	$24,916,165	Washington	$17,735,544	$8,608,090	$26,343,634	5.70%
West Virginia	$6,994,949	$3,176,132	$10,171,081	West Virginia	$7,412,363	$2,805,313	$10,217,676	0.50%
Wisconsin	$13,246,911	$8,588,953	$21,835,864	Wisconsin	$15,868,646	$7,544,102	$23,412,748	7.20%
Wyoming	$4,917,055	$1,241,982	$6,159,037	Wyoming	$5,748,448	$1,152,882	$6,901,330	12.10%
	CDC Total FY 06**	**ASPR Total FY 06****	**Grand Total FY 06****		**CDC Total FY 07****	**ASPR* Total FY 07****	**Grand Total FY 07****	**Grand Total % Change FY 06 -- FY 07**
	$766,440,000	**$460,216,752**	**$1,226,656,752**		**$896,736,525**	**$415,032,000**	**$1,311,768,525**	**6.90%**

*The 2006 Pandemic and All-Hazards Preparedness Act transferred oversight of the grant program from the Health Resources and Services Administration (HRSA) to the new HHS Office of the Assistant Secretary for Preparedness and Response (ASPR). **Note that totals include 3 major U.S. metropolitan areas, Chicago, L.A. County, and New York City, U.S. Territories, such as Puerto Rico and Guam, and Freely Associated States of the Pacific, such as the Marshall Islands, as well as the 50 states and D.C. *Sources: (1) U.S. Department of Health and Human Services, "HHS Provides $430 Million to States to Enhance Hospital and Other Health Care Facilities Preparedness for Public Health Emergencies," June 28, 2007 News Release. <http://www.hhs.gov/news/press/2007pres/06/pr20070628a.html> (2) U.S. Department of Health and Human Services, "HHS Announces $896.7 Million in Funding to States for Public Health Preparedness and Emergency Response," July 17, 2007 News Release. <http://www.hhs.gov/news/press/2007pres/07/pr20070717c.html>*

Appendix B:

INFLUENZA ANTIVIRAL DRUG PURCHASES BY STATES AND ENTITIES

INFLUENZA ANTIVIRAL DRUG PURCHASES BY STATES AND ENTITIES						
State	**Population**	**Initial Allocation* (06/30/06)**	**Total Subsidized Purchase**	**Total Unsubsidized Purchase**	**All Antivirals Purchased by Entity**	**Percent of Allocation Purchased as of 11/13/07**
Alabama	4,503,726	472,860	472,860	27,107	499,967	106%
Alaska	648,280	68,065	28,576	11,164	39,740	58%
Arizona	5,579,222	585,780	67,717	0	67,717	12%
Arkansas	2,727,774	286,397	286,398	0	286,398	100%
California**	25,591,206	2,686,899	2,686,899	35,582	2,722,481	101%
Colorado	4,547,633	477,470	0	0	0	0%
Connecticut	3,486,960	366,107	0	0	0	0%
Delaware	818,166	85,902	85,902	35,262	121,164	141%
District of Columbia	557,620	58,546	0	45,000	45,000	77%
Florida	16,999,181	1,784,796	0	0	0	0%
Georgia	8,676,460	910,968	474,022	0	474,022	52%
Hawaii	1,248,755	131,111	131,111	41,376	172,487	132%
Idaho	1,367,034	143,529	8,567	0	8,567	6%
Illinois**	9,779,966	1,026,829	512,228	0	512,228	50%
Indiana	6,199,571	650,912	650,912	0	650,912	100%
Iowa	2,941,976	308,887	308,887	0	308,887	100%
Kansas	2,724,786	286,084	286,084	0	286,084	100%
Kentucky	4,118,189	432,381	216,224	0	216,224	50%
Louisiana	4,493,665	471,804	471,804	0	471,804	100%
Maine	1,309,205	137,457	137,457	0	137,457	100%
Maryland	5,512,310	578,754	210,727	0	210,727	36%
Massachusetts	6,420,357	674,093	0	0	0	0%
Michigan	10,082,364	1,058,578	1,058,578	18,372	1,076,950	102%
Minnesota	5,064,172	531,703	117,287	0	117,287	22%
Mississippi	2,882,594	302,652	0	0	0	0%
Missouri	5,719,204	600,477	600,477	0	600,477	100%
Montana	918,157	96,400	8,174	0	8,174	8%
Nebraska	1,737,475	182,423	70,102	0	70,102	38%
Nevada	2,242,207	235,416	3,465	132,049	135,514	58%
New Hampshire	1,288,705	135,305	135,305	0	135,305	100%
New Jersey	8,642,412	907,393	831,600	0	831,600	92%
New Mexico	1,878,562	197,236	68,930	0	68,930	35%
New York**	11,126,683	1,168,225	1,168,225	109,664	1,277,889	109%
North Carolina	8,421,190	884,167	560,380	0	560,380	63%
North Dakota	633,400	66,503	0	0	0	0%
Ohio	11,437,680	1,200,877	1,089,789	187,981	1,277,770	106%
Oklahoma	3,506,469	368,155	49,390	0	49,390	13%
Oregon	3,564,330	374,230	13,300	0	13,300	4%
Pennsylvania	12,370,761	1,298,844	974,081	0	974,081	75%
Rhode Island	1,076,084	112,981	0	0	0	0%
South Carolina	4,148,744	435,589	325,020	24,479	349,499	80%
South Dakota	764,905	80,310	24,575	55,735	80,310	100%
Tennessee	5,845,208	613,706	47,124	0	47,124	8%
Texas	22,103,374	2,320,701	838,556	67,584	906,140	39%
Utah	2,352,119	246,956	50,668	0	50,668	21%
Vermont	619,343	65,027	52,021	0	52,021	80%
Virginia	7,365,284	773,304	785,521	30,791	816,312	106%
Washington	6,131,298	643,744	293,073	0	293,073	46%
West Virginia	1,811,440	190,189	95,095	15,000	110,095	58%
Wisconsin	5,474,290	574,763	152,979	0	152,979	27%
Wyoming	502,111	52,718	52,718	0	52,718	100%
State Subtotal:	269,962,607	28,344,203	16,502,808	837,146	17,339,954	61%
Other Entity						
American Samoa	57,884	6,077	0	0	0	0%
Chicago	2,869,121	301,238	200,545	0	200,545	67%
Fed States of Micronesia	108,143	11,354	0	0	0	0%
Guam	163,593	17,176	0	0	0	0%
LA County	9,871,506	1,036,440	1,036,440	0	1,036,440	100%
Marshall Islands	56,429	5,925	0	0	0	0%
New York City	8,085,742	848,947	30	0	30	0%
Northern Marianas Islands	76,129	7,993	0	0	0	0%
Palau	19,717	2,070	0	0	0	0%
Puerto Rico	3,877,881	407,151	407,151	0	407,151	100%
Virgin Islands	108,814	11,425	0	0	0	0%
Entity Subtotal	25,294,959	2,655,796	1,644,166	0	1,644,166	62%
TOTAL	**295,257,566**	**30,999,999**	**18,146,974**	**837,146**	**18,984,120**	**61%**

* "Initial allocation" is for subsidized treatment courses only; 25% federal subsidy per treatment course. ** California, Illinois and New York States' population does not include residents of Los Angeles County, Chicago, and New York City. These 3 entities received their own allocation of federally-subsidized antivirals based on their populations. Zero = no intent to purchase. *Source: Office of the Assistant Secretary for Preparedness and Response, updated November 13, 2007.*

Appendix C:

STATE LAWS EXTENDING COMPREHENSIVE LEGAL LIABILITY PROTECTIONS TO PROFESSIONAL HEALTH CARE VOLUNTEERS DURING PUBLIC HEALTH EMERGENCIES

Authors: Mary Elizabeth Harty, MPH, JD anticipated 2009; Jennifer Sheer, MPH anticipated 2008, and Sara Rosenbaum, Hirsh professor and chair, Department of Health Policy, The George Washington University School of Public Health and Health Services.

Introduction

The use of law to incentivize desired personal conduct is a common approach to social policy in the U.S. Law can be used to reward behavior as well as shield individuals from sanctions that might otherwise apply in the absence of special legal protections. Contracts that provide economic rewards to health care professionals whose performance meets quality benchmarks is an example of the use of law to incentivize desired behavior through the creation of an enforceable expectation of financial reward when certain measurable standards are satisfied.

State laws that create liability shields for "Good Samaritans" (that is, health care professionals or other individuals who come to the aid of another at the scene of an emergency) provide an example of the use of law to induce desirable private conduct through the use of a liability shield. The Good Samaritan doctrine is a basic concept in American law, a part of the "common law" on which the entire American legal system rests.[226] States may vary in certain respects in the degree of protections they accord to health professionals, but Good Samaritan statutes are universal.

Good Samaritan laws are limited in two fundamental respects. First, they generally provide a very specific shield that focuses on *emergency assistance* rendered at the scene of an emergency. As a result, once assistance passes beyond the immediate emergency stage or the scene of assistance moves outside an emergency location, the shield may end. Second, Good Samaritan laws provide an *affirmative defense* to a liability claim by permitting the defendant to show that his or her conduct merits a shield because of the emergency nature of the intervention, (typically) the absence of any expectation of compensation, the absence of objection to the treatment, and the absence of gross negligence, willful and wanton conduct, or intentional injury.[227] That is, one's status as a Good Samaritan must be proved by the person who claims the shield as part of a defense to a negligence claim. Rather than being prospective, therefore, Good Samaritan laws are retrospective in nature.

The limitations of the Good Samaritan doctrine create challenges during a declared public health emergency when government officials, no matter how well-equipped, may determine there is a need to augment public services with private assistance, not only during the immediate emergency but also in the aftermath as normal conditions slowly return. The California wildfires offer a recent example of a situation in which the period of immediate post-emergency recovery may last for weeks or months beyond the last extinguished wildfire, as the state deals with the long-term economic, social, and physical and mental health needs of victims. Furthermore, because the number of uninsured Americans is at an all-time high, the need to continue volunteer health care assistance beyond the end of the acute phase of the emergency may be particularly pressing in the case of health care.

The limited nature of Good Samaritan statutes has prompted public health law

experts to recommend enactment of more expansive shield laws that both create a prospective system for extending liability shields in advance of necessary health care services and that protect organized volunteer actions more broadly than does the restrictive coverage available under Good Samaritan doctrine.

Methods

This statutory analysis was intended to stratify states in relation to the structure of their statutory emergency protections for health care volunteers. Researchers, including an experienced attorney with extensive experience in legal analysis and statutory and legal interpretation, used standard legal research techniques and tools to identify all state statutes governing the subject of volunteer health professional services during emergencies. An electronic file was created for each state in order to permit both in-state and cross state comparisons. The search identified states whose statutory codes clearly and unambiguously establish comprehensive legal emergency-related legal protections for health care volunteers that surpass the protections available under the Good Samaritan doctrine.

In view of the limitations of the doctrine, the search focused on two critical elements that would serve to separate state statutes from longstanding Good Samaritan doctrine:

1. The existence of an authorized process to allow medical and other health professionals to become designated as voluntary health care workers acting under specific emergency response protocols; and
2. A shield that is tied to a declared emergency.

Findings

Table 1: State by State Comparison Table: Healthcare Volunteer Liability Protection is available on TFAH's website, http://www.healthyamericans.org/reports/bioterror07.

Good Samaritan Statutes

Complete results are presented in Table 1. Table 1 shows that, as of Fall 2007, all states had codified the Good Samaritan doctrine, with certain variations visible, such as the range of conduct that falls outside the scope of protection; the range and specificity of medical and health professionals protected; and the nature of the qualifications on the defense (i.e., the exclusion from the shield of certain types of conduct such as gross negligence, willful or wanton conduct, or intentional injuries). In all states, therefore, physicians are given an affirmative defense if sued for ordinary negligence in connection with emergency care rendered at the scene of an emergency.

Additional Liability Protections

Table 1 also shows that, as of Fall 2007, 29 states and the District of Columbia had statutes that reach beyond their Good Samaritan protections and recognize additional protections from liability during periods of publicly declared emergencies. These statutes vary considerably.

Seventeen states and the District of Columbia,[228] identified by a ✓+, maintain statutes that meet both key criteria. That is, the laws in these states provide both for immunity of health care volunteers during emergencies and anticipate the establishment of a formal prospective designation process.

An additional 12 states,[229] designated as ✓**L**, meet the second prong of our test. That is, these state laws allow for the extension of immunity for health care professionals during emergencies. However, nothing in these laws indicates the existence of a prospective designation system. Such a system would need to be specified in regulation or through an authoritative state ruling.

A final group of 21 states,[230] identified by an "**A**," maintain statutory schemes that either are silent on the issue of protections for vol-

untary health care workers during emergencies or are sufficiently ambiguous so that no such prospective immunity arrangement can be inferred in the absence of comprehensive implementing regulations or a ruling from an authoritative state official.

State laws extending prospective and comprehensive protections for healthcare volunteers during periods of declared emergencies vary significantly in statutory scope and clarity. Some statutes provide discretion to public officials to determine the types of health care professionals and emergency workers who will receive qualified immunity;[231] allow officials to set the conditions that must be met to qualify for a voluntary worker designation; and give officials considerable latitude in determining the duration of the immunity.

Statutes also vary with respect to the scope of the immunity granted (i.e., covering all conduct or only conduct not grossly negligent, willful and wanton, or intentionally injurious). Because the immunity shield may be limited in scope, these statutes are not absolute. That is, an injured person could allege liability on the ground that the worker's conduct fell below the level of care necessary to qualify for the immunity shield. The most comprehensive of these laws would also provide for the defense of volunteers as employees of the state in the event that conduct falls below the immunity threshold, while not condoning willful, wanton, or reckless behavior.

Discussion

This review of state statutes suggests that approximately one-third of all states have enacted immunity protections for health care volunteers that are linked to formal emergencies and contemplate some sort of prospective designation process in order to clarify the immunized status of the worker rather than requiring the worker to raise an affirmative defense at trial. An additional 20 percent of all states have statutes that specify emergency immunity, but the presence of a prospective designation system can not be inferred from the statute itself. Finally, about 40 percent of all states either have not addressed the issue or else have done so in an ambiguous fashion that requires further regulatory and interpretive clarification.

Of course, even the clearest emergency health care volunteer immunity statutes would require additional guidance, since creating a prospective designation process, as well as the development of emergency operational protocols, present complex implementation challenges. Further study of the implementation experiences in states with comprehensive statutes is warranted, as is further study of those states that have not enacted such laws. Such a study might shed light on the implementation challenges that arise, the response rates among private health professionals, and the actual or anticipated operation of states' qualified immunity statutes. Additional research might also reveal whether in the event of suits against designated volunteers alleging *ultra vires* conduct, additional state tort claims act protections also might apply.

It is not immediately clear why more states have not acted to put such protections in place. One hypothesis is that liability reforms in these states would be understood as obviating the need for further immunity action. The presence of emergency immunity statutes, however, in states such as Indiana and California, both known for their expansive tort reform efforts, suggests otherwise.

Appendix D:

METHODOLOGY FOR EMERGENCY PREPAREDNESS DRILLS

TFAH contracted with ANSER/Analytic Services, Inc. to survey State Army and Air National Guard units. The survey was conducted by initiating an email data request from the Office of the Chief Surgeon, National Guard Bureau Joint Staff to the State Surgeon and State Air Surgeon within each state Army and Air National Guard. The survey is comprised of the National Guards of the 50 states and the District of Columbia. The survey was initiated to help gauge the level of effort towards building civil-military integration and surge capacity in the event of a catastrophic health event. The question posed was: "During 2007, did your (Army or Air Guard) unit participate (or intend to participate) in any scenario-based exercise (pandemic, bioterrorism, other) with members of your state's public health department?"

A state received one full point if an exercise (any type such as tabletop, full scale, etc.) was conducted, or scheduled to be conducted, in the 2007 calendar year given evidence of collaborative participation, or attempts at collaboration, between the state health department and the Army or Air National Guard. No point was awarded if the state did not conduct, or is not scheduled to conduct an exercise, during the 2007 calendar year.

Due to a high non-response rate (29 percent), TFAH contacted state health officials via an email request sent out by the Association of State and Territorial Health Officials (ASTHO). State health officials were asked the same question posed to the State Army and Air National Guard and were given until November 21, 2007 to respond. Using both survey requests, TFAH was able to obtain a 100 percent response rate.

Appendix E:

COMMUNITY RESILIENCY

METHODOLOGY:

In order to measure community resiliency, TFAH considered the number of volunteers signed up to participate in the Medical Reserve Corps (MRC). The Office of the Civilian Volunteer Medical Reserve Corps provided TFAH with the total number of MRC units and volunteers per unit as of October 22, 2007. This information was verified by TFAH by using information provided on the Medical Reserve Corps website, http://www.medicalreservecorps.gov/FindMRC.asp and tallying MRC volunteer totals on October 22, 2007. The numbers are based on self-reported data from MRC units posted on their profiles on the MRC web site. The number of volunteers from each program was totaled by state and used to calculate a volunteer per 100,000 persons figure. See below for a complete spreadsheet of volunteers by state.

Medical Reserve Corps Volunteers per 100,000 persons			
State	2006 Census Population Estimates	Total Number of MRC Volunteers	MRC Volunteers per 100,000
Alabama	4,599,030	3342	73
Alaska	670,053	330	49
Arizona	6,166,318	2841	46
Arkansas	2,810,872	158	6
California	36,457,549	6562	18
Colorado	4,753,377	845	18
Connecticut	3,504,809	5605	160
D.C.	581,530	874	150
Delaware	853,476	214	25
Florida	18,089,888	3600	20
Georgia	9,363,941	2437	26
Hawaii	1,285,498	452	35
Idaho	1,466,465	2643	180
Illinois	12,831,970	4160	32
Indiana	6,313,520	3991	63
Iowa	2,982,085	181	6
Kansas	2,764,075	581	21
Kentucky	4,206,074	2539	60
Louisiana	4,287,768	228	5
Maine	1,321,574	42	3
Maryland	5,615,727	6833	122
Massachusetts	6,437,193	13948	217
Michigan	10,095,643	618	6
Minnesota	5,167,101	4496	87
Mississippi	2,910,540	291	10
Missouri	5,842,713	469	8
Montana	944,632	79	8
Nebraska	1,768,331	637	36
Nevada	2,495,529	243	10
New Hampshire	1,314,895	248	19
New Jersey	8,724,560	4754	54
New Mexico	1,954,599	449	23
New York	19,306,183	11356	59
North Carolina	8,856,505	1281	14
North Dakota	635,867	2859	450
Ohio	11,478,006	5961	52
Oklahoma	3,579,212	3572	100
Oregon	3,700,758	540	15
Pennsylvania	12,440,621	1785	14
Rhode Island	1,067,610	537	50
South Carolina	4,321,249	687	16
South Dakota	781,919	0	0
Tennessee	6,038,803	21706	359
Texas	23,507,783	9131	39
Utah	2,550,063	516	20
Vermont	623,908	207	33
Virginia	7,642,884	8809	115
Washington	6,395,798	753	12
West Virginia	1,818,470	1252	69
Wisconsin	5,556,506	326	6
Wyoming	515,004	68	13

Source: Office of the Civilian Volunteer Medical Reserve Corps, Office of the Surgeon General <http://www.medicalreservecorps.gov/FindMRC.asp>

Appendix F:

METHODOLOGY FOR FLU VACCINATION RATES

Data for this analysis were obtained from the Behavioral Risk Factor Surveillance System dataset (publicly available at http://www.cdc.gov/brfss). BRFSS is an annual cross-sectional survey that measures behavioral risk factors in the adult population (18 years of age or older) living in households. Data are collected from a random sample of adults (one per household) through a telephone survey. The BRFSS currently includes data from 50 states, D.C., Puerto Rico, Guam, and the Virgin Islands. The 2006 statistics are the most recent data available.

To conduct the analyses, TFAH contracted with Daniel Eisenberg, Ph.D., assistant professor, and Edward N. Okeke, MBBS, Health Service Organization and Policy Doctoral Student, at the Department of Health Management and Policy of the University of Michigan School of Public Health. Researchers weighted the data using sample weights provided by the CDC in the dataset and then merged data on the FLUSHOT variable from 2003-2006. The FLUSHOT variable is the question, "During the past 12 months, have you had a flu shot?" Respondents who answered "I don't know" or refused to answer were dropped from the analysis, though this accounted for less than 0.3 percent of the data. Three-year rolling averages were then calculated for individuals ages 65 and older, by state. Hypothesis testing, to determine if there were significant changes from 2003-2005 to 2004-2006, was then carried out. There were 211,291 observations from 2003-2005, and 246,773 observations from 2004-2006.

According to information CDC provided to TFAH, each state conducts its own survey for BRFSS. States conduct interviews each month in accordance with a standardized prescribed protocol and enter results into computer-assisted telephone interviewing (CATI) computer files. States edit and correct completed interviews each month using an editing program provided by CDC. Data are submitted to CDC on a monthly basis, after which the data undergo rigorous data quality checks. While the system has existed since 1984, all states have participated since 1994. Data are collected and analyzed using standardized methodology and results are released annually.

Appendix G:

METHODOLOGY FOR STATE PUBLIC HEALTH BUDGET INDICATOR

TFAH conducted an analysis of state spending on public health for the last 2 budget cycles, fiscal years 2005-2006 and 2006-2007. For those states that only report their budgets in biennium cycles, the 2007-2009 period (or the 2006-2008 and 2007-2008 period for Virginia and Wyoming respectively) was used, and the percent change was calculated from the last biennium, 2005-2007 (or 2004-2006 and 2005-2006 for Virginia and Wyoming respectively).

This analysis was conducted from August to October of 2007 using publicly available budget documents through state government web sites. Based on what was made publicly available, budget documents used included either executive budget documents that listed actual expenditures, estimated expenditures, or final appropriations; appropriations bills enacted by the state's legislature; or documents from legislative analysis offices.

In response to feedback received from previous editions of TFAH's *Ready or Not?* report, TFAH defined "public health" to broadly include all health spending with the exception of Medicaid, CHIP, or comparable health coverage programs for low-income residents. Federal funds, mental health funds, addiction or substance abuse-related funds, WIC funds, services related to developmental disabilities or severely disabled persons, and state-sponsored pharmaceutical programs also were not included. In a few cases, state budget documents did not allow these programs, or other similar human services, to be disaggregated; these exceptions are noted. For most states, all state funding, regardless of general revenue or other state funds (e.g., dedicated revenue, fee revenue, etc.), was used. In some cases, only general revenue funds were used in order to separate out federal funds; these exceptions are also be noted.

Since each state allocates and reports its budget in a unique way, comparisons across states are obviously difficult. This methodology may include programs that, in some cases, the state may consider a public health function, but the methodology used was selected to maximize the ability to be consistent across states. As a result, there may be programs or items states may wish to be considered as "public health" that may not be included in order to maintain the comparative value of the data.

Finally, to improve the comparability of the budget data between FY 2005-2006 and FY 2006-2007 (or between biennium), TFAH adjusted the FY 2006-2007 numbers for inflation (using a 0.97 conversion factor based on the U.S. Dept. of Labor Bureau of Labor Statistics' Consumer Price Index Inflation Calculator at http://www.bls.gov/cpi/).

Appendix H:

KEY DELIVERABLES AND DUE DATES UNDER PAHPA (P.L. 109-417)

Key Deliverables and Due Dates under P.L. 109-417			
Deliverable	**Why the Deliverable is Important**	**Due Date**	**Met?**
Section 201 (g) (1) -- Achievement of **measurable evidence-based benchmarks and objective standards**. Not later than 180 days after the date of enactment of the Pandemic and All-Hazards Preparedness Act, the HHS secretary **shall develop or where appropriate adopt, and require the application of, measurable evidence-based benchmarks and objective standards that measure levels of preparedness**. In developing such benchmarks and standards, the secretary shall consult with and seek comments from state, local and tribal officials and private entities, as appropriate. **Where appropriate, the HHS secretary shall incorporate existing objective standards.**	This demonstrates the federal government's ability to develop clear, evidence-based performance metrics to evaluate federal and state emergency preparedness.	June 2007	Yes. HHS is using "existing objective standards" until it is able to develop new ones, currently scheduled to be written at the close of the current budget period.[232]
Section 201 (g) (2) -- Criteria for pandemic influenza plans. Not later than 180 days after the date of enactment of the Pandemic and All-Hazards Preparedness Act, the HHS secretary **shall develop and disseminate to the chief executive officer of each state criteria for an effective state plan for responding to pandemic influenza**.	This demonstrates the federal government's ability to provide clear direction and guidance to state emergency planners and keep variation among states pandemic plans to a minimum.	June 2007	Yes. HHS sent a letter with criteria and guidance to states on January 26, 2007.[233] A revised set of criteria for state pandemic influenza plans will be developed by HHS and submitted for state review.
Section 202 (d) (2) -- Public Health Situational Awareness. Not later than 180 days after the date of enactment the Pandemic and All- Hazards Preparedness Act, the HHS Secretary shall submit to the appropriate committees of the congress a strategic plan demonstrating the steps **the HHS secretary will undertake to develop, implement, and evaluate the interoperable network of systems for real-time disease detection and surveillance**.	This reflects federal commitment to a near real-time electronic surveillance system, which is necessary to quickly identify and track disease outbreaks and biological and chemical incidents (accidental or intentional).	June 2007	No. In progress.

Key Deliverables and Due Dates under P.L. 109-417			
Deliverable	**Why the Deliverable is Important**	**Due Date**	**Met?**
Section 301(a) (C) (2) -- Joint review and medical surge capacity strategic plan. Not later than 180 days after date of enactment of the Pandemic and All-Hazards Preparedness Act, the HHS secretary, in coordination with the secretary of Homeland Security, secretary of Defense, and secretary of Veterans Affairs, **shall conduct a joint review of the National Disaster Medical System**. Such review shall include an evaluation of medical surge capacity.	This demonstrates the ability of HHS to lead and coordinate with other key federal agencies on issues of concern for public health preparedness, such as medical surge capacity.	June 2007	Yes. The Department has completed a joint review with the Departments of homeland security, defense, and veterans affairs of the National Disaster Medical System (NDMS).
Section 201(j) (1) -- Annual reporting requirements. Each entity shall prepare and submit to the HHS secretary annual reports on its activities under this section and section 319C-2 of the Public Health Service Act. Each such report shall be prepared by, or in consultation with, the health department. In order to properly evaluate and compare the performance of different entities assisted under this section and section 319C-2 and to assure the proper expenditure of funds under this section and section 319C-2, such reports shall be in such standardized form and **contain such information as the HHS secretary determines and describes within 180 days of the date of enactment of the Pandemic and All-Hazards Preparedness Act**.	This demonstrates the federal government's commitment to tracking the use of federal preparedness dollars.	June 2007	No. In progress.
Section 303(a) -- Not later than 180 days after the date of enactment of the Pandemic and All-Hazards Preparedness Act, the HHS secretary, in collaboration with state, local, and tribal officials, **shall build on state, local, and tribal programs in existence on the date of enactment of such Act to establish and maintain a Medical Reserve Corps** to provide for an adequate supply of volunteers in the case of a Federal, State, local, or tribal public health emergency. The corps shall be headed by a director who shall be appointed by the HHS secretary and shall oversee the activities of the corps chapters that exist at the state, local, and tribal levels.	This reflects the federal government's ability to set forth a nationally recognized certification process for healthcare volunteers who serve in emergency public health events and recruit said volunteers.	June 2007	Yes. The department expanded the Medical Reserve Corps (MRC) to provide for an adequate supply of volunteers in the case of a federal, state, tribal, territorial, or local public health emergency.

Key Deliverables and Due Dates under P.L. 109-417			
Deliverable	**Why the Deliverable is Important**	**Due Date**	**Met?**
Section 401 -- Not later than 6 months after the date of enactment of the Pandemic and All-Hazards Preparedness Act, the HHS secretary **shall develop and make public a strategic plan to integrate biodefense and emerging infectious disease requirements with the advanced research and development**, strategic initiatives for innovation, and the procurement of qualified countermeasures and qualified pandemic or epidemic products.	This illustrates the federal government's ability to set a national strategy for research and development, innovation support, and procurement of countermeasures to chemical, biological, radiological, and nuclear (CBRN) agents and emerging infectious diseases.	June 2007	Yes. On July 7, 2007, Secretary Michael Leavitt published a *Draft BARDA Strategic Plan for Countermeasure Research, Development and Procurement*, to guide and facilitate the research, development, innovation, and procurement of medical countermeasures and build upon established national strategies and directives.
Section 303(b) -- Not later than 12 months after the date of enactment of the Pandemic and All-Hazards Preparedness Act, the **HHS secretary shall link existing state verification systems to maintain a single national interoperable network of systems**, each system being maintained by a state or group of states, for the purpose of verifying the credentials and licenses of health care professionals who volunteer to provide health services during a public health emergency.	This reflects the federal government's ability to set forth a nationally recognized certification process for healthcare volunteers who serve in emergency public health events.	December 2007	In progress. ESAR-VHP guidelines are currently being finalized. The department has written compliance requirements for state participation in the ESAR-VHP program. Starting in FY 2009 participation in ESAR-VHP will be a mandatory requirement to receive grant dollars from the PHEP.
Section 402 -- The HHS secretary **shall establish the National Biodefense Science Board** to provide expert advice and guidance to the HHS secretary on scientific, technical and other matters of special interest to the Department of Health and Human Services regarding current and future chemical, biological, nuclear, and radiological agents, whether naturally occurring, accidental, or deliberate.	This illustrates the federal government's ability to convene leading experts from government, private sector and research institutions to come together to guide the national strategy for research and development, innovation support, and procurement of countermeasures to chemical, biological, radiological, and nuclear (CBRN) agents and emerging infectious diseases.	December 2007	In progress. On May 24, 2007, Secretary Leavitt established and issued a call for nominations to the National Biodefense Science Board (NBSB). To date, none of the 13 members have been appointed.[234]
Section 402(A) -- Not later than one year after the date of enactment of the Pandemic and All-Hazards Preparedness Act, **the HHS secretary shall hold the first meeting of the National Biodefense Science Board**.	This illustrates the federal government's ability to convene leading experts in government, private sector and research institutions to come together to guide the national strategy for research and development, innovation support, and procurement of countermeasures to chemical, biological, radiological, and nuclear (CBRN) agents and emerging infectious diseases.	December 2007	In progress. The PAHPA Implementation Progress Report states the first NBSB meeting will be December 17-18, 2007.

Key Deliverables and Due Dates under P.L. 109-417			
Deliverable	**Why the Deliverable is Important**	**Due Date**	**Met?**
Section 102(d) -- Amends the Public Health Service Act by inserting Section 2814(1). The HHS secretary shall oversee the implementation of the national preparedness goal of taking **into account the public health and medical needs of at-risk individuals in the event of a public health emergency**. Not later than one year after the date of enactment of the Pandemic and All-Hazards Preparedness Act, the HHS secretary shall **prepare and submit to the U.S. Congress a report describing the progress made on implementing the duties** described in this section.	This benchmark reflects how well the federal government is implementing plans to reach at-risk populations, including the elderly and other special needs individuals.	December 2007	Yes. The Pandemic and All-Hazards Preparedness Act Progress Report released in November 2007 describes the progress made toward implementing duties related to at-risk individuals.
Section 201(g) (5) -- **Withholding of amounts** from entities that fail to achieve benchmarks or submit influenza plans.	This component of the bill links funding with accountability, which motivates states to meet preparedness benchmarks.	October 2008 (FY 2009)	In progress. The department is developing guidelines for funds to be withheld from awardees that fail to meet the benchmarks, performance measures, and plans for responding to pandemic influenza. Policies will be applied and funds withheld from the existing preparedness grants programs if deemed appropriate by FY 2009.
Section 202 (d) (1) -- Public Health Situational Awareness. Not later than 2 years after the date of enactment of the Pandemic and All- Hazards Preparedness Act, the HHS secretary, in collaboration with state, local, and tribal public health officials, **shall establish a near real-time electronic nationwide public situational awareness capability through an interoperable network to share data and information to enhance early detection of rapid response to, and management of, potentially catastrophic infectious disease outbreaks and other public health emergencies that originate domestically or abroad**. Such network shall be built on existing state situational awareness systems or enhanced systems that enable such connectivity.	This reflects federal commitment to a near real-time electronic surveillance system, which is necessary to quickly identify and track disease outbreaks and biological and chemical incidents (accidental or intentional).	January 2009	In progress.

Key Deliverables and Due Dates under P.L. 109-417			
Deliverable	**Why the Deliverable is Important**	**Due Date**	**Met?**
Section 103 -- Amends the Public Health Service Act and adds Section 2802(a) (1). Preparedness and response regarding public health emergencies. Beginning in 2009 and every four years thereafter, the **HHS secretary shall prepare and submit to the relevant committees of the congress a coordinated strategy (to be known as the National Health Security Strategy)** and any revisions thereof, **and an accompanying implementation plan for public health emergency preparedness and response**.	This quadrennial review of public health emergency preparedness illustrates the importance of the issues and the need to keep continually updating and revising preparedness plans.	2009	In progress. The framework for the National Health Security Strategy is currently under development and the department is in the initial phases of reaching out to non-governmental stakeholders and determining plans for routine engagement at appropriate and meaningful intervals.

Source: Assistant Secretary for Preparedness and Response. Pandemic and All-Hazards Preparedness Act Progress Report. Washington, DC: U.S. Department of Health and Human Services, November 2007. http://www.hhs.gov/aspr/conference/pahpa/2007/pahpa-progress-report-102907.pdf (accessed October 31, 2007), except where noted.

Appendix I:

ESTIMATED MORTALITY AND MORBIDITY FOR A SEVERE PANDEMIC AND IMPACT ON UNINSURED POPULATION

Methodology

TFAH's state estimates are based on models of a severe pandemic outbreak. These estimates are similar to assumptions made by the U.S. Centers for Disease Control and Prevention (CDC) and White House Homeland Security Council for a severe pandemic resembling the pandemic flu of 1918.[235,236] The state-specific estimates of illness and death rates in each state used the same assumptions of a 30% attack rate and a 2.5% case-fatality rate. Under this scenario the national death rate would be 0.75%. The rates were calculated using the Flu Aid computer modeling program developed by CDC, which also considers the age and health risk factors of state population. Note that Flu Aid is limited in its ability to account for density issues, such as how close people live together in cities versus rural areas.

The estimated mortality and morbidity rates for the uninsured U.S. population are based on the assumption that the percent of people who contract influenza would be evenly distributed among those with and without insurance. Scientists note that people with compromised immune systems, such as the elderly, the very young, and people with pre-existing medical conditions, are more likely to get seasonal flu.[237] It is likely, therefore, that those same people would be more likely to get a more aggressive and/or contagious flu. To remain conservative, however, TFAH does not factor this into its calculations.

- **Population Data:** TFAH used 2006 U.S. Census data for state population estimates.[238]
- **Illness and Fatality Data:** TFAH used CDC's Flu Aid to generate state illness and fatality projections. Factors taken into account in the model include age, attack rates, mortality rates, and health risk. CDC makes health risk and mortality assumptions based on age in each state. To determine state-specific calculations, the 2006 U.S. Census age data was entered into the Flu Aid program.
- **Health Insurance Coverage:** TFAH used 2006 U.S. Census data for health insurance coverage status by state.[239]

The numbers are rounded to the thousandths place for clarity and presentation in the Table: *Estimated Mortality and Morbidity for a Severe Pandemic and Impact on Uninsured Population.*

ESTIMATED MORTALITY AND MORBIDITY FOR A SEVERE PANDEMIC AND IMPACT ON UNINSURED POPULATION

State	2006 Census Population Estimates	Mortality %	Morbidity %	2006 Estimated Mortality	2006 Estimated Morbidity	2006 Census % Uninsured Estimates	2006 Estimated Mortality for Uninsured	2006 Estimated Morbidity for Uninsured
Alabama	4,599,030	0.80%	29.20%	37,000	1,343,000	15.20%	5,600	204,100
Alaska	670,053	0.56%	29.44%	4,000	197,000	16.50%	700	32,500
Arizona	6,166,318	0.64%	29.36%	39,000	1,811,000	20.90%	8,200	378,500
Arkansas	2,810,872	0.79%	29.21%	22,000	821,000	18.90%	4,200	155,200
California	36,457,549	0.69%	29.31%	252,000	10,685,000	18.80%	47,400	2,008,800
Colorado	4,753,377	0.64%	29.36%	30,000	1,396,000	17.20%	5,200	240,100
Connecticut	3,504,809	0.82%	29.18%	29,000	1,023,000	9.40%	2,700	96,200
Delaware	853,476	0.73%	29.27%	6,000	250,000	12.10%	700	30,300
D.C.	581,530	0.86%	29.14%	5,000	169,000	(B)	(B)	(B)
Florida	18,089,888	0.82%	29.18%	149,000	5,278,000	21.20%	31,600	1,118,900
Georgia	9,363,941	0.62%	29.38%	58,000	2,751,000	17.70%	10,300	486,900
Hawaii	1,285,498	0.81%	29.19%	10,000	375,000	8.80%	900	33,000
Idaho	1,466,465	0.65%	29.35%	10,000	430,000	15.40%	1,500	66,200
Illinois	12,831,970	0.76%	29.24%	98,000	3,752,000	14.00%	13,700	525,300
Indiana	6,313,520	0.77%	29.23%	49,000	1,845,000	11.80%	5,800	217,700
Iowa	2,982,085	0.86%	29.14%	26,000	869,000	10.50%	2,700	91,200
Kansas	2,764,075	0.80%	29.20%	22,000	807,000	12.30%	2,700	99,300
Kentucky	4,206,074	0.78%	29.22%	33,000	1,229,000	15.60%	5,100	191,700
Louisiana	4,287,768	0.76%	29.24%	32,000	1,254,000	21.90%	7,000	274,600
Maine	1,321,574	0.82%	29.18%	11,000	386,000	9.30%	1,000	35,900
Maryland	5,615,727	0.73%	29.27%	41,000	1,644,000	13.80%	5,700	226,900
Massachusetts	6,437,193	0.84%	29.16%	54,000	1,877,000	10.40%	5,600	195,200
Michigan	10,095,643	0.79%	29.21%	80,000	2,949,000	10.50%	8,400	309,600
Minnesota	5,167,101	0.74%	29.26%	38,000	1,512,000	9.20%	3,500	139,100
Mississippi	2,910,540	0.75%	29.25%	22,000	851,000	20.80%	4,600	177,000
Missouri	5,842,713	0.80%	29.20%	47,000	1,706,000	13.30%	6,300	226,900
Montana	944,632	0.79%	29.21%	7,000	276,000	17.10%	1,200	47,200
Nebraska	1,768,331	0.80%	29.20%	14,000	516,000	12.30%	1,700	63,500
Nevada	2,495,529	0.55%	29.45%	14,000	735,000	19.60%	2,700	144,100
New Hampshire	1,314,895	0.73%	29.27%	10,000	385,000	11.50%	1,200	44,300
New Jersey	8,724,560	0.80%	29.20%	70,000	2,548,000	15.50%	10,900	394,900
New Mexico	1,954,599	0.69%	29.31%	14,000	573,000	22.90%	3,200	131,200
New York	19,306,183	0.80%	29.20%	155,000	5,637,000	14.00%	21,700	789,200
North Carolina	8,856,505	0.71%	29.29%	63,000	2,594,000	17.90%	11,300	464,300
North Dakota	635,867	0.89%	29.11%	6,000	185,000	12.20%	700	22,600
Ohio	11,478,006	0.83%	29.17%	95,000	3,348,000	10.10%	9,600	338,100
Oklahoma	3,579,212	0.79%	29.21%	28,000	1,045,000	18.90%	5,300	197,500
Oregon	3,700,758	0.76%	29.24%	28,000	1,082,000	17.90%	5,000	193,700
Pennsylvania	12,440,621	0.89%	29.11%	111,000	3,621,000	10.00%	11,100	362,100
Rhode Island	1,067,610	0.85%	29.15%	9,000	311,000	8.60%	800	26,700
South Carolina	4,321,249	0.72%	29.28%	31,000	1,265,000	15.90%	4,900	201,100
South Dakota	781,919	0.83%	29.17%	6,000	228,000	11.80%	700	26,900
Tennessee	6,038,803	0.75%	29.25%	45,000	1,766,000	13.70%	6,200	241,900
Texas	23,507,783	0.63%	29.37%	148,000	6,904,000	24.50%	36,300	1,691,500
Utah	2,550,063	0.56%	29.44%	14,000	751,000	17.40%	2,400	130,700
Vermont	623,908	0.78%	29.22%	5,000	182,000	(B)	(B)	(B)
Virginia	7,642,884	0.72%	29.28%	55,000	2,238,000	13.30%	7,300	297,700
Washington	6,395,798	0.72%	29.28%	46,000	1,873,000	11.80%	5,400	221,000
West Virginia	1,818,470	0.91%	29.09%	17,000	529,000	13.50%	2,300	71,400
Wisconsin	5,556,506	0.78%	29.22%	44,000	1,623,000	8.80%	3,900	142,800
Wyoming	515,004	0.74%	29.26%	4,000	151,000	14.60%	600	22,000

Notes: The estimated mortality and morbidity rates for the uninsured U.S. population are based on the assumption that the percent of people who contract pandemic flu would be evenly distributed among those with insurance and those without. Scientists note that people with compromised immune systems, such as the elderly, the very young, and people with pre-existing medical conditions, are more likely to get seasonal flu. Therefore, it is likely that those same people would be more likely to get pandemic flu. However, to remain conservative, TFAH does not factor this into its numbers. Estimated mortality and morbidity figures are rounded for presentation.

(B) = base less than 75,000

Source: (1) U.S. Census Bureau, "Current Population Survey, 2007 Annual Social and Economic Supplement, Health Insurance Coverage Status by State for All People," (U.S Government: Washington, DC, 2007), <http://pubdb3.census.gov/macro/032007/health/h06_000.htm> Accessed October 5, 2007. (2) U.S Census Bureau, "Population Estimates Program, 2006 Population Estimates, generated by Serena Vinter using American FactFinder," (U.S. Government, Washington, DC: 2006) <http://factfinder.census.gov>; Accessed October 5, 2007.

Appendix J:

METHODOLOGY FOR APIC SURVEY

Author: Terri Rebmann, PhD, RN, CIC, APIC Emergency Preparedness Committee

Infection Control Professionals (ICP) who are members of the **Association for Professionals in Infection Control and Epidemiology (APIC)** from all U.S. hospitals, regardless of size, location, or for-profit status, were invited to complete a survey; the sample, therefore, was non-random. The only exclusion criterion was hospital location outside the U.S. The database was assessed for respondents who completed multiple surveys (defined by having the same APIC identification number); none were found. A respondent who did not indicate the state in which his hospital was located was excluded. The final database contained 630 subjects. All data were anonymous and included no identifiers within the database that could link an ICP or hospital to the data.

Responses were received from participants in all U.S. states except Delaware. There was a higher response rate in the Midwest (33.5%) and South (32.5%) than in the West (18.4%) or Northeast (15.61%) (χ^2 = 65.9, $p < .001$) . There are differences among hospital distributions across the U.S. in relation to geographical region, but the response distribution for this study is slightly different than would be expected given the hospital locations according to the U.S. Census data.[240] This sample contained a disproportionately higher number of respondents from hospitals located in the Midwest and Northeastern states than would be expected ($\chi^2 = 93.33$, $p < .001$).

The Statistical Package for the Social Sciences 14.0 was used for all analyses (SPSS). All items were dummy coded because they consisted of nominal data.[241] Hospital locations were categorized into four regions (Midwest, Northeast, South, and West) based on U.S. Census divisions.[242,243] Descriptive statistics by region were computed for each question and used to describe surge capacity and other infectious disease emergency preparedness issues such as ICP participation in a hospital disaster preparedness committee; around-the-clock infection control support; participation in disaster exercises; and plan for healthcare worker vaccination/antiviral prioritization. A series of Kruskal Wallis one-way analyses of variance tests were used to evaluate the relationship between a hospital's geographic region (independent variable) and its ability to care for an influx of potentially infectious patients in relation to various surge capacity and infectious disease emergency preparedness measures (dependent variables). Non-parametric tests were conducted because the questions provided nominal level data.[244] Significant findings were followed by Mann-Whitney U post hoc tests. Items that were answered "I don't know" were coded as missing data and excluded from analyses for the Kruskal Wallis and Mann-Whitney *U* tests. A series of Chi Square Goodness of Fit tests were used to evaluate whether there were significant differences between the proportion of respondents from the U.S. Census regions and those from hospitals of varying sizes.

The survey was developed, administered, and analyzed by members of the APIC Emergency Preparedness Committee, chaired by Terri Rebmann, PhD, RN, CIC, associate director for Curricular Affairs and assistant professor, Institute for Biosecurity, Saint Louis University, School of Public Health. Other members of the committee include: Sharon Alexander, Barbara Citarella, Michael Cloughessy, Bill Coll, Sue LaPointe, Diane Moroz, Michael Oleson, Barbara Russell, Veronica Urdaneta, Bill Wagner, and Rita Wilson. Denise Graham and Mary Schantz also assisted in this process as representatives from APIC Headquarters.

Appendix K:

REGIONAL DEFINITIONS USED IN PUBLIC OPINION POLL

Northeast: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont, Delaware, New Jersey, New York, Pennsylvania.

Central: Illinois, Indiana, Michigan, Ohio, Wisconsin, Iowa, Kansas, Minnesota, Missouri, North Dakota, South Dakota, Nebraska.

South: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, Texas, Virginia, District of Columbia, Kentucky, Maryland, Oklahoma, Tennessee, West Virginia.

West: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming, Alaska, California, Oregon, Hawaii, Washington.

Appendix L:

LIST OF ACRONYMS

ACRONYM	FULL NAME
ACIP	CDC's Advisory Committee on Immunization Practices
ACS	Alternative Care Sites
AHRQ	Agency for Health Research and Quality
APHL	Association of Public Health Laboratories
APIC	Association for Professionals in Infection Control and Epidemiology
ARC	American Red Cross
ASPR	Assistant Secretary for Preparedness and Response
ASTHO	Association of State and Territorial Health Officials
AVA	Anthrax Vaccine Adsorbed
BARDA	Biomedical Advanced Research and Development Authority
BENS	Business Executives for National Security
BRFSS	Behavioral Risk Factor Surveillance System
CBRN	Chemical, Biological, Radiological, and Nuclear
CCAP	Community Continuity Atlanta Partnership
CDC	Centers for Disease Control and Prevention
CERT	Community Emergency Response Team
CFSAN	Center for Food Safety and Applied Nutrition
COPTER	Coordinating Office for Terrorism Preparedness and Emergency Response
CRI	Cities Readiness Initiative
CRS	Congressional Research Service
DOD	Department of Defense
DTPA	Diethylenetriamine pentaacetate (Pentetic acid)
eLRN	Environmental Laboratory Response Network
EMAC	Emergency Management Assistance Compact
EPA	Environmental Protection Agency
ERL	Electronic Laboratory Results
ESAR-VHP	Emergency System for the Advance Registration of Volunteer Health Professionals
FDA	Food and Drug Administration
GAO	Government Accountability Office
H5N1	An extremely virulent strain of the Avian Influenza Virus
HAN	Health Alert Network
HHS	U.S. Department of Health and Human Services
HRSA	Health Resources and Services Administration
HPP	Hospital Preparedness Program
HSPD	Homeland Security Presidential Directive
IOM	Institute of Medicine
KI	Liquid Potassium Iodide
LRN	Laboratory Response Network
MDR-TB	Multi-drug Resistant Tuberculosis
MRC	Medical Reserve Corps
MRSA	Methicillin-Resistant Staphylococcus aureus
MVA	Modified Vaccinia Ankara
NACCHO	National Association of County and City Health Officials
NAS	National Academy of Sciences
NBHPP	National Bioterrorism Hospital Preparedness Program
NCCUSL	National Conference of Commissioners on Uniform State Laws
NDMS	National Disaster Medical System
NEDSS	National Electronic Disease Surveillance System
NELRP	Nursing Scholarship Program and the Nurse Education Loan Repayment Program
NHSC	National Health Service Corps
NIH	National Institutes of Health
NIOSH	National Institute for Occupational Safety and Health
NPIs	Non-pharmaceutical Interventions
PAHPA	Pandemic and All-Hazards Preparedness Act
PHEMCE	Public Health Emergency Medical Countermeasures Enterprise
PHIN	Public Health Information Network
PPV	Pneumococcal Polysaccharide Vaccine
rPA	Recombinant Protective Antigen
SARS	Severe Acute Respiratory Syndrome
S-CHIP	State Children's Health Insurance Program
SLEP	Shelf Life Extension Program
SNS	Strategic National Stockpile
TB	Tuberculosis
TFAH	Trust for America's Health
UEVHPA	Uniform Emergency Volunteer Health Practitioners Act
USDA	U.S. Department of Agriculture
XDR-TB	Extensively Drug-resistant Tuberculosis

Endnotes

1 Greenberg, Quinlan, Rosner Research. "Trust for America's Health Frequency Questionnaire." October 18-22, 2007.

2 R.M. Klevens, et al. "Invasive Methicillin-Resistant *Staphylococcus Aureau* Infections in the United States." *Journal of the American Medical Association* 298, no. 15 (October 17, 2007): 1763-1771.

3 Homeland Security Council. *Homeland Security Presidential Directive/HSPD 21: Public Health and Medical Preparedness.* Washington, D.C.: The White House, 2007.

4 Homeland Security Council. *National Strategy for Homeland Security.* Washington, D.C.: The White House, 2007.

5 J. Monke. *Agroterrorism: Threats and Preparedness.* Washington, D.C.: Congressional Research Service, 2004.

6 B.G. Blackburn, et al. "Surveillance for Waterborne Disease Outbreaks Associated with Drinking Water – United States, 2001-2002." *Morbidity and Mortality Weekly* 53, (SS08), 23-45, (October 22, 2004).

7 Institute of Medicine. *The Future of the Public's Health in the 21st Century.* Washington, D.C.: National Academies Press, 2002.

8 Robert Wood Johnson Foundation. *Press Release: Public Health Leaders Recommend Voluntary National Accreditation Program.* Washington, D.C.: RWJF, 2006.

9 University of North Carolina School of Public Health. "Local Health Department Accreditation." University of North Carolina. http://www.sph.unc.edu/nciph/local_health_department_accreditation_2556_2694.html (accessed October 17, 2007).

10 North Carolina Local Health Department Accreditation Board. "Overview." State of North Carolina. http://nciph.sph.unc.edu/accred/ (accessed October 17, 2007).

11 University of North Carolina School of Public Health. "Local Health Department Accreditation." University of North Carolina. http://www.sph.unc.edu/nciph/local_health_department_accreditation_2556_2694.html (accessed October 17, 2007).

12 National Network of Public Health Institutes. "The Multi-State Learning Collaborative." http://nnphi.org/home/section/1-15//view/39/ (accessed October 17, 2007).

13 Ibid.

14 S.A. Lister and H. Stockdale. *Pandemic Influenza: An Analysis of State Preparedness and Response Plans.* Washington, D.C.: Congressional Research Service, September 24, 2007, http://www.opencrs.com/rpts/RL34190_20070924.pdf (accessed October 3, 2007).

15 Institute of Medicine. *The Future of the Public's Health in the 21st Century.* Washington, D.C.: National Academies Press, 2002.

16 U.S. Centers for Disease Control and Prevention. *Public Health Emergency Preparedness Cooperative Agreement: 2006 End-of-Year Performance Measures, Definitions and Guidance.* Atlanta, GA: U.S. Department of Health and Human Services, 2007.

17 S.A. Lister and H. Stockdale. *Pandemic Influenza: An Analysis of State Preparedness and Response Plans.* Washington, D.C.: Congressional Research Service, September 24, 2007, http://www.opencrs.com/rpts/RL34190_20070924.pdf (accessed October 3, 2007).

18 Trust for America's Health. *Ready or Not? Protecting the Public's Health from Diseases, Disasters, and Bioterrorism.* Washington, D.C.: TFAH, 2006.

19 C. Nelson, et al. *Working Paper: New Tools for Assessing State and Local SNS Readiness.* Washington, D.C.: RAND, 2007.

20 Delaware Health and Social Services. *Press Release: Delaware's Grades make CDC 'Honor Roll' for Stockpile Preparation.* Dover, DE: State of Delaware, March 21, 2007.

21 C. Nelson, et al. *Working Paper: New Tools for Assessing State and Local SNS Readiness.* Washington, D.C.: RAND, 2007.

22 CDC COTPER staff provided this information to TFAH.

23 G.W. Parker. *HHS Update on the Advanced Development and Procurement of Medical Countermeasures, Statement before the Committee on Homeland Security, Subcommittee on Emerging Threats, Cybersecurity, and Science & Technology, U.S. House of Representatives.* Washington, D.C.: U.S. Department of Health and Human Services, 2007, http://www.hhs.gov/asl/testify/2007/04/t20070418b.html (accessed September 12, 2007).

24 Homeland Security Council. *National Strategy for Pandemic Influenza Implementation Plan: One Year Summary.* Washington, D.C.: The White House, July 2007.

25 CDC communicated this to TFAH in private communication dated November 28, 2007.

26 K. Rhodes. *Project BioShield: Actions Needed to Avoid Repeating Past Mistakes, Statement of Keith Rhodes, Chief Technologist, Center for Technology and Engineering, Applied Research and Methods, Government Accountability Office, Testimony before the Committee on Homeland Security and Governmental Affairs, U.S. Senate.* Washington, D.C.: U.S. Government Accountability Office, 2007.

27 U.S. Government Accountability Office. *Project BioShield: Actions Needed to Avoid Repeating Past Problems with Procuring New Anthrax Vaccine and Managing the Stockpile of Licensed Vaccine.* Washington, D.C.: U.S. Government Accountability Office, 2007.

28 D.G. McNeil Jr. "U.S. Issues Guidelines on Use of Face Masks in Flu Outbreak." *The New York Times,* May 4, 2007.

29 S.A. Lister and H. Stockdale. *Pandemic Influenza: An Analysis of State Preparedness and Response Plans.* Washington, D.C.: Congressional Research Service, September 24, 2007, http://www.opencrs.com/rpts/RL34190_20070924.pdf (accessed October 3, 2007).

30 C. Nelson. "RAND Congressional Briefing: Measuring State and Local Public Health Preparedness." Washington, D.C., September 10, 2007.

31 C. Nelson, et al. "Assessing Public Health Emergency Preparedness: Concepts, Tools, and Challenges." *Annual Review of Public Health* 28, (April, 2006): 1-18.

32 B. Mlynar. "Mass-Vaccination Exercise Gets Flu Shots to 1,584." *The Emporia Gazette,* October 12, 2007, *http://www.emporiagazette.com/news/2007/oct/12/mass vaccination_exercise_gets_flu_shots_1584/* (accessed October 22, 2007).

33 M. Leavitt. "Secretary Mike Leavitt's Blog: Strategic National Stockpiles." U.S. Department of Health and Human Services. http://secretarysblog.hhs.gov/my_weblog/2007/10/strategic-natio.html (accessed November 14, 2007).

34 U.S. Department of Health and Human Services. "Antivirals – State Allocations." U.S. Government. http://pandemicflu.gov/plan/states/antivirals.html (accessed October 4, 2007).

35 Association of State and Territorial Health Officials. *Survey of State and Territorial Pandemic Influenza Antiviral Purchase and Stockpiling October 2006.* Arlington, VA: ASTHO, 2006.

36 J.R. Richmond. "The 1, 2, 3's of Biosafety Levels." Centers for Disease Control and Prevention. http://www.cdc.gov/od/ohs/symp5/jyrtext.htm (accessed November 29, 2007).

37 M. Skeels. "Public Health Labs in a Changing Landscape." *American Society of Microbiology News 65,* (2003): 479-483.

38 E. Gursky, et al. "Anthrax 2001: Observations on the Medical and Public Health Response." *Biosecurity and Bioterrorism: Biodefense Strategy, Practice and Science* 1, no. 2 (2003): 97-110.

39 U.S. Centers for Disease Control and Prevention. *Facts about the Laboratory Response Network.* Atlanta, GA: U.S. Department of Health and Human Services, December 6, 2006, http://www.bt.cdc.gov/lrn/pdf/lrnfactsheet.pdf (accessed September 17, 2007).

40 Association of Public Health Laboratories. *Lab Preparedness Must Be Maintained.* Silver Spring, MD: APHL, March 2007, http://www.aphl.org/policy/priority_issues/fact_sheets/Documents/2007_Fact_Sheets/LabPreparedness.pdf (accessed September 17, 2007).

41 U.S. Centers for Disease Control and Prevention. *Facts about the Laboratory Response Network.* Atlanta, GA: U.S. Department of Health and Human Services, December 6, 2006, http://www.bt.cdc.gov/lrn/pdf/lrnfactsheet.pdf (accessed September 17, 2007).

42 Association of Public Health Laboratories. *Lab Preparedness Must Be Maintained.* Silver Spring, MD: APHL, March 2007, http://www.aphl.org/policy/priority_issues/fact_sheets/Documents/2007_Fact_Sheets/LabPreparedness.pdf (accessed September 17, 2007).

43 Association of Public Health Laboratories. *Chemical Terrorism Preparedness in the Nation's State Public Health Laboratories.* Silver Spring, MD: APHL, May 2007, http://www.aphl.org/about_aphl/products_and_publications/Documents/Chemical_Terrorism_Preparedness_Issue_Brief_2007.pdf (accessed September 17, 2007).

44 U.S. Centers for Disease Control and Prevention. *Guidance Document for Continuation of the Public Health Emergency Preparedness (PHEP) Cooperative Agreements for Budget Period 8.* Atlanta, GA: U.S. Department of Health and Human Services, 2007.

45 Ibid.

46 U.S. Centers for Disease Control and Prevention. "Chemical Emergencies: Chemical Agents." U.S. Department of Health and Human Services. http://www.bt.cdc.gov/agent/agentlistchem.asp (accessed September 18, 2007).

47 J.W. Loonsk, et al. "The Public Health Information Network (PHIN) Preparedness Initiative." *Journal of the American Medical Association* 13, no. 1 (2006): 1-4.

48 U.S. Centers for Disease Control and Prevention. "An Overview of the NEDSS Initiative." U.S. Department of Health and Human Services. http://www.cdc.gov/nedss/About/overview.html (accessed October 1, 2007).

49 K. Eban. "Biosense Or Biononsense? Years of Development and Hundreds of Millions of Dollars Later, What Has the CDC's Syndromic Surveillance Program Accomplished?" *The Scientist* 21, no. 4 (April, 2007): 32, http://www.the-scientist.com/2007/4/1/32/1/ (accessed October 22, 2007).

50 K. Hope, et al. "Syndromic Surveillance: Is It a Useful Tool for Local Outbreak Detection?" *Journal of Epidemiology and Community Health* 60, no. 5 (May, 2006): 374-375.

51 K. Eban. "Biosense Or Biononsense? Years of Development and Hundreds of Millions of Dollars Later, What Has the CDC's Syndromic Surveillance Program Accomplished?" *The Scientist* 21, no. 4 (April, 2007): 32, http://www.the-scientist.com/2007/4/1/32/1/ (accessed October 22, 2007).

52 U.S. Centers for Disease Control and Prevention. "HAN/Public Health Preparedness Jurisdictions." U.S. Department of Health and Human Services. http://www2a.cdc.gov/HAN/statemap.asp (accessed October 2, 2007).

53 National Conference of Commissioners on Uniform State Laws. "Uniform Volunteer Emergency Health Practitioners Act – A Summary." NCCUSL. http://www.uevhpa.org/DesktopDefault.aspx?tabindex=0&tabid=53 (accessed October 15, 2007).

54 Ibid.

55 The American Institute of Architects. "Good Samaritan Legislation: Provisions for the Architectural Profession." Washington, D.C.: AIA, 2007. http://www.aia.org/liv_disaster_GSleg (accessed November 13, 2007).

56 North Carolina Institute for Public Health. "Iowa First to Enact New Good Samaritan Bill." Chapel Hill, NC: University of North Carolina School of Public Health, 2007, http://nciph.sph.unc.edu/law/ud_052107.htm (accessed November 13, 2007).

57 A. Martinez Fonts. *Improving Emergency Preparedness and Response Capabilities, Statement of Alfonso Martinez-Fonts, Jr. Assistant Secretary, Private Sector Office, Office of Policy Department of Homeland Security before the Committee on House Homeland Security Subcommittee on Emergency Communications, Preparedness, and Response.* Washington, D.C.: U.S. Department of Homeland Security, 2007.

58 American Red Cross. *Pandemic Influenza Planning Guidance: Update on Worker Safety, Additional Mass Care Planning Tools.* Washington, D.C.: ARC, 2007.

59 U.S. Department of Health and Human Services. *Law Enforcement Pandemic Influenza Planning Checklist.* Washington, D.C.: U.S. Government, 2007, www.pandemicflu.gov/plan/workplaceplanning/lawenforcement.pdf (accessed October 17, 2007).

60 C. La Valley. "Operation Tests Efficiency of Disaster Survivors' Care." *Payson Roundup,* August 10, 2007, http://www.paysonroundup.com/section/localnews/story/30013 (accessed September 7, 2007).

61 A.S. Tyson. "Many Lessons in Disaster Drill: Emergency Preparedness Improves, but Gaps are Evident." *The Washington Post,* May 14, 2007, sec. A.

62 M. Dynes. "Drill Helps Push Mass Meds: State's Responders Act to Ensure Distribution Flow in an Emergency." *Wyoming Tribune Eagle,* February 7, 2007, http://www.wyomingnews.com/articles/2007/02/07/top_story/01local_02-07-07.txt (accessed September 7, 2007).

63 Ibid.

64 Homeland Security Council. *Homeland Security Presidential Directive/HSPD 21: Public Health and Medical Preparedness.* Washington, D.C.: The White House, 2007.

65 Bureau of Labor Statistics. *News Release: Volunteering in the United States, 2006.* Washington, D.C.: U.S. Department of Labor, 2007.

66 Ibid.

67 Ibid.

68 B. Maldin-Morgenthau, et al. "Roundtable Discussion: Corporate Pandemic Preparedness." *Biosecurity and Bioterrorism* 5, no. 2 (June, 2007): 168-173, http://www.upmc-biosecurity.org/website/resources/publications/2007_origarticles/2007_article_pdfs/2007-07-03-corporatepreparedness.pdf (accessed September 25, 2007).

69 Deloitte Center for Health Solutions. *Year Two Pandemic Preparedness Survey.* Washington, D.C.: Deloitte & Touche USA LLP, December 14, 2006, http://www.deloitte.com/dtt/cda/doc/content/us_chs_yeartwopandemicsurvey121806v1.pdf (accessed September 25, 2007).

70 Ibid.

71 Georgia Business Force. "What is BENS Business Force?" Business Executives for National Security (BENS). http://www.bensbusinessforce.org/NBFaboutus.htm (accessed October 30, 2007).

72 Georgia Department of Human Resources. *News Release: GDPH and Private Sector Test Bioterrorism Emergency Response Exercise.* Atlanta, GA: 2007.

73 Ibid.

74 M. Schoch-Spana, et al. "Community Engagement: Leadership Tool for Catastrophic Health Events." *Biosecurity and Bioterrorism* 5, no. 1 (January, 2007): 8-25, http://www.upmc-biosecurity.org/website/resources/publications/2007_orig-articles/2007_article_pdfs/2007-04-04-communityengagementleadershiptool.pdf (accessed September 26, 2007).

75 National Research Council. *Citizen Engagement in Emergency Planning for a Flu Pandemic: A Summary of the October 23, 2006 Workshop of the Disasters Roundtable.* Washington, D.C.: National Academies Press, 2007, http://www.nap.edu/catalog.php?record_id=11921 (accessed September 26, 2007).

76 CIDRAP. "Promising Practices Pandemic Preparedness Tools: Community Engagement." University of Minnesota. http://www.pandemicpractices.org/practices/list.do?topic-id=11 (accessed September 27, 2007).

77 Ibid.

78 U.S. Centers for Disease Control and Prevention. "Key Facts about Seasonal Influenza (Flu)." U.S. Department of Health and Human Services. http://www.cdc.gov/flu/keyfacts.htm (accessed October 12, 2007).

79 Ibid.

80 N. Smith, et al. "Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP)." *Morbidity and Mortality Weekly Report* 55, no. RR10 (July 28, 2006): 1.

81 L.A. Jackson, et al. "Evidence of Bias in Estimates of Influenza Vaccine Effectiveness in Seniors." *International Journal of Epidemiology* 35, (2006): 337-344.

82 L. Simonsen, et al. "Mortality Benefits of Influenza Vaccination in Elderly People: An Ongoing Controversy." *Lancet Infectious Diseases* 7, (October, 2007): 658-666.

83 Ibid.

84 L.A. Jackson, et al. "Evidence of Bias in Estimates of Influenza Vaccine Effectiveness in Seniors." *International Journal of Epidemiology* 35, (2006): 337-344.

85 K.L. Nichol, et al. "Effectiveness of Influenza Vaccine in the Community-Dwelling Elderly." *The New England Journal of Medicine* 357, no. 14 (October 4, 2007): 1373-1381.

86 J.D. Treanor. "Influenza – The Goal of Control." *The New England Journal of Medicine* 357, no. 14 (October 4, 2007): 1439-1441.

87 J.S. Brownstein, et al. "Identifying Pediatric Age Groups for Influenza Vaccination Using a Real-Time Regional Surveillance System." *American Journal of Epidemiology* 162, no. 7 (2005): 686-693.

88 U.S. Centers for Disease Control and Prevention. "Childhood Influenza Vaccination Coverage – United States, 2004-05 Influenza Season." *Morbidity and Mortality Weekly Report* 55, no. 39 (October 6, 2006): 1062-1065.

89 *The 2006 Pandemic and All-Hazards Preparedness Act*, 109th Cong., 2d sess. Public Law 109-417. (December 19, 2006).

90 *The 2006 Pandemic and All-Hazards Preparedness Act*, 109th Cong., 2d sess. Public Law 109-417. (December 19, 2006).

91 Ibid

92 U.S. Centers for Disease Control and Prevention. *Guidance Document for Continuation of the Public Health Emergency Preparedness (PHEP) Cooperative Agreements for Budget Period 8.* Atlanta, GA: U.S. Department of Health and Human Services, 2007.

93 U.S. Centers for Disease Control and Prevention. *Public Health Emergency Preparedness Cooperative Agreement: 2006 End-of-Year Performance Measures, Definitions and Guidance.* Atlanta, GA: U.S. Department of Health and Human Services, 2007.

94 *The 2006 Pandemic and All-Hazards Preparedness Act*, 109th Cong., 2d sess. Public Law 109-417. (December 19, 2006).

95 Institute of Medicine, Board on Health Sciences Policy. *Workplan: Research Priorities in Emergency Preparedness and Response for Public Health Systems.* Washington, D.C.: IOM, October 2007.

96 Assistant Secretary for Preparedness and Response. "Pandemic and All-Hazards Preparedness Act Progress Report." Washington, D.C.: U.S. Department of Health and Human Services, November 2007, http://www.hhs.gov/aspr/conference/pahpa/2007/pahpa-progress-report-102907.pdf (accessed October 31, 2007).

97 Ibid.

98 *The 2006 Pandemic and All-Hazards Preparedness Act*, 109th Cong., 2d sess. Public Law 109-417. (December 19, 2006).

99 M.P. Derby, et al. "Poison Control Center-Based Syndromic Surveillance for Foodborne Illness." *Morbidity and Mortality Weekly Report* 54, no. Suppl (August 26, 2005): 35-40.

100 U.S. Centers for Disease Control and Prevention. *Guidance Document for Continuation of the Public Health Emergency Preparedness (PHEP) Cooperative Agreements for Budget Period 8.* Atlanta, GA: U.S. Department of Health and Human Services, 2007.

101 Ibid.

102 *The 2006 Pandemic and All-Hazards Preparedness Act*, 109th Cong., 2d sess. Public Law 109-417. (December 19, 2006).

103 Assistant Secretary for Preparedness and Response. "Pandemic and All-Hazards Preparedness Act Progress Report." Washington, D.C.: U.S. Department of Health and Human Services, November 2007, http://www.hhs.gov/aspr/conference/pahpa/2007/pahpa-progress-report-102907.pdf (accessed October 31, 2007)

104 Assistant Secretary for Preparedness and Response. "Draft BARDA Strategic Plan for Medical Countermeasure Research, Development, and Procurement." Washington, D.C.: U.S. Department of Health and Human Services, July 2007, http://www.hhs.gov/aspr/barda/documents/draft-bardaplan.pdf (accessed October 31, 2007).

105 Assistant Secretary for Preparedness and Response. "Biomedical Advanced Research and Development Authority." U.S. Department of Health and Human Services. http://www.hhs.gov/aspr/barda/index.html (accessed October 10, 2007).

106 F. Gottron. *Project BioShield: Appropriations, Acquisitions, and Policy Implementation Issues for Congress.* Washington, D.C.: Congressional Research Service, March 8, 2007.

107 U.S. Department of Health and Human Services. *News Release: HHS Awards Contracts for Advanced Development of New Medical Countermeasures.* Washington, D.C.: DHHS, October 5, 2007.

108 F. Gottron. *Project BioShield: Appropriations, Acquisitions, and Policy Implementation Issues for Congress.* Washington, D.C.: Congressional Research Service, March 8, 2007.

109 Assistant Secretary for Preparedness and Response. "HHS PHEMCE Strategy and HHS PHEMCE Implementation Plan." U.S. Department of Health and Human Services. http://www.hhs.gov/aspr/barda/phemce/enterprise/strategy/index.html (accessed October 10, 2007).

110 Assistant Secretary for Preparedness and Response. "Public Health Emergency Medical Countermeasures (PHEMC) Enterprise." U.S. Department of Health and Human Services. http://www.hhs.gov/aspr/barda/phemce/index.html (accessed October 10, 2007).

111 U.S. Department of Health and Human Services. *News Release: HHS Buys Next Generation Smallpox Vaccine.* Washington, D.C.: DHHS, June 4, 2007.

112 U.S. Department of Health and Human Services. *News Release: HHS Purchases Additional Anthrax Vaccine for Stockpile*. Washington, D.C.: DHHS, September 26, 2007.

113 National Institutes of Health. *Request for Applications: Medical Countermeasures to Enhance Platelet Regeneration and Increase Survival Following Radiation Exposure (RC1)*. Washington, D.C.: U.S. Department of Health and Human Services, September 27, 2007.

114 National Institutes of Health. *Request for Applications: Radiation Combined Injury: Radiation Exposure in Combination with Burn, Wound, Trauma or Infection (Phased Innovation Award [R21/R33])*. Washington, D.C.: U.S. Department of Health and Human Services, September 27, 2007.

115 F. Gottron. *Project BioShield: Appropriations, Acquisitions, and Policy Implementation Issues for Congress*. Washington, D.C.: Congressional Research Service, March 8, 2007.

116 Ibid.

117 U.S. Government Accountability Office. *Project BioShield: Actions Needed to Avoid Repeating Past Problems with Procuring New Anthrax Vaccine and Managing the Stockpile of Licensed Vaccine*. Washington, D.C.: U.S. Government Accountability Office, 2007.

118 K. Rhodes. *Project BioShield: Actions Needed to Avoid Repeating Past Mistakes, Statement of Keith Rhodes, Chief Technologist, Center for Technology and Engineering, Applied Research and Methods, Government Accountability Office, Testimony before the Committee on Homeland Security and Governmental Affairs, U.S. Senate*. Washington, D.C.: U.S. Government Accountability Office, 2007.

119 Ibid.

120 Ibid.

121 Homeland Security Council. *National Strategy for Pandemic Influenza Implementation Plan: One Year Summary*. Washington, D.C.: The White House, July 2007.

122 U.S. Government Accountability Office. *Influenza Pandemic: Further Efforts Are Needed to Ensure Clearer Federal Leadership Roles and an Effective National Strategy*. Washington, D.C.: GAO, August 2007, http://www.gao.gov/new.items/d07781.pdf (accessed September 7, 2007).

123 Trust for America's Health. *Ready or Not? Protecting the Public's Health in the Age of Bioterrorism*. Washington, D.C.: TFAH, 2003.

124 *The 2006 Pandemic and All-Hazards Preparedness Act*, 109th Cong., 2d sess. Public Law 109-417. (December 19, 2006).

125 Assistant Secretary for Preparedness and Response. "Pandemic and All-Hazards Preparedness Act Progress Report." Washington, D.C.: U.S. Department of Health and Human Services, November 2007, http://www.hhs.gov/aspr/conference/pahpa/2007/pahpa-progress-report-102907.pdf (accessed October 31, 2007).

126 U.S. Department of Health and Human Services. "State Pandemic Influenza Operations Plans." U.S. Government. http://www.pandemicflu.gov/plan/states/stateoperatingplan.html (accessed October 3, 2007).

127 Assistant Secretary for Preparedness and Response. "Pandemic and All-Hazards Preparedness Act Progress Report." Washington, D.C.: U.S. Department of Health and Human Services, November 2007, http://www.hhs.gov/aspr/conference/pahpa/2007/pahpa-progress-report-102907.pdf (accessed October 31, 2007).

128 S.D. Holmberg, et al. "State Plans for Containment of Pandemic Influenza." *Emerging Infectious Diseases* 12, no. 9 (September 2006, 2006): October 3, 2007, http://www.cdc.gov/ncidod/EID/vol12no09/06-0369.htm (accessed October 3, 2007).

129 S.A. Lister and H. Stockdale. *Pandemic Influenza: An Analysis of State Preparedness and Response Plans*. Washington, D.C.: Congressional Research Service, September 24, 2007, http://www.opencrs.com/rpts/RL34190_20070924.pdf (accessed October 3, 2007).

130 Ibid.

131 National Association of County and City Health Officials. *Federal Funding for Public Health Emergency Preparedness: Implications and Ongoing Issues for Local Health Departments*. Washington, D.C.: NACCHO, 2007.

132 National Bioterrorism Hospital Preparedness Program. "2007 NBHPP Awardee Conference Call Highlights." Washington, D.C.: U.S. Department of Health and Human Services, January 18, 2007.

133 U.S. Department of Health and Human Services. *Budget in Brief: Department of Health and Human Services FY 2008*. Washington, D.C.: DHHS, 2007.

134 U.S. Department of Health and Human Services. *HHS Announces $75 Million in Supplemental Funding to States for Pandemic Flu Preparedness*. Washington, D.C.: DHHS, August 30, 2007.

135 *The 2006 Pandemic and All-Hazards Preparedness Act*, 109th Cong., 2d sess. Public Law 109-417. (December 19, 2006).

136 Assistant Secretary for Preparedness and Response. "Pandemic and All-Hazards Preparedness Act Progress Report." Washington, D.C.: U.S. Department of Health and Human Services, November 2007, http://www.hhs.gov/aspr/conference/pahpa/2007/pahpa-progress-report-102907.pdf (accessed October 31, 2007).

137 S.A. Lister. *Pandemic Influenza: Appropriations for Public Health Preparedness and Response*. Washington, D.C.: Congressional Research Service, January 23, 2007, http://fpc.state.gov/documents/organization/80724.pdf (accessed September 7, 2007).

138 U.S. Government Accountability Office. *Influenza Pandemic: Further Efforts Are Needed to Ensure Clearer Federal Leadership Roles and an Effective National Strategy*. Washington, D.C.: GAO, August 2007, http://www.gao.gov/new.items/d07781.pdf (accessed September 7, 2007).

139 U.S. Census Bureau. *Current Population Survey, 2007 Annual Social and Economic Supplement, Health Insurance Coverage Status by State for all People*. Washington, D.C.: U.S. Government, 2007, http://pubdb3.census.gov/macro/032007/health/h06_000.htm (accessed October 5, 2007).

140 J. Matheny, et al. "Financial Effects of an Influenza Pandemic on U.S. Hospitals." *Journal of Health Care Finance* 31, no. 1 (Fall, 2007): 58-63.

141 Ibid.

142 U.S. Centers for Disease Control and Prevention. *Interim Pre-Pandemic Planning Guidance: Community Strategy for Pandemic Influenza Mitigation in the United States – Early, Targeted, Layered Use of Nonpharmaceutical Interventions*. Washington, D.C.: U.S. Department of Health and Human Services, 2007.

143 H. Hartmann. *The Healthy Families Act: Impacts on Workers, Business, the Economy, and Public Health, Testimony of Heidi Hartmann, President of the Institute for Women's Policy Research, before the U.S. Senate Committee on Health, Education, Labor and Pensions*. Washington, D.C.: Institute for Women's Policy Research, 2007.

144 A. Quinlan, et al. *Preparedness in America Today*. Washington, D.C.: Greenberg Quinlan Rosner Research, November 2007.

145 R.J. Blendon, et al. "Pandemic Influenza and the Public: Survey Findings. Presented at the Institute of Medicine on October 26, 2006." Cambridge, MA: Harvard School of Public Health, Project on the Public and Biological Security, 2006, http://www.hsph.harvard.edu/panflu/IOM_Avian_flu.ppt (accessed October 2, 2007).

146 U.S. Army Medical Materiel Agency. "Extending the Shelf Life of Critical 'War Reserves' Medical Materiel Using the FDA/DOD Shelf Life Extension Program." U.S. Department of Defense. http://www.usamma.army.mil/documents/SLEPInfoPaper-Mar2005.pdf (accessed November 5, 2007).

147 Association of State and Territorial Health Officials. *Survey of State and Territorial Pandemic Influenza Antiviral Purchase and Stockpiling October 2006.* Arlington, VA: ASTHO, 2006.

148 U.S. Department of Health and Human Services. "Pandemic Flu Planning Checklist for Individuals and Families." U.S. Government. http://pandemicflu.gov/plan/individual/checklist.html (accessed October 30, 2007).

149 D.M. Walker. *Federal Oversight of Food Safety, High-Risk Designation Can Bring Needed Attention to Fragmented System, Testimony before the Subcommittee on Agriculture, Rural Development, FDA, and Related Agencies, Committee on Appropriations, House of Representatives.* Washington, D.C.: U.S. Government Accountability Office, 2007. http://www.gao.gov/new.items/d07449t.pdf (accessed November 5, 2007).

150 R.A. Robinson. *Food Safety and Security, Fundamental Changes Needed to Ensure Safe Food.* Washington, D.C.: U.S. Government Accountability Office, 2001.

151 M. Taylor. *Improving Food Safety, Noontime Seminar at the George Washington University School of Public Health and Health Policy.* Washington, D.C.: September 24, 2007.

152 Association for Professionals in Infection Control and Epidemiology. "About APIC." APIC. http://www.apic.org/AM/Template.cfm?Section=About_APIC (accessed November 1, 2007).

153 National Association of Public Hospitals and Health Systems. *Research Brief: Hospital Staffing and Surge Capacity During a Disaster Event.* Washington, D.C.: NAPH, May 2007.

154 D.P. Davis, et al. "Hospital Bed Surge Capacity in the Event of a Mass-Casualty Incident." *Prehospital and Disaster Medicine* 20, no. 3 (May 3, 2005): 169-176.

155 C.H. Schultz and K.L. Koenig. "State of Research in High-Consequence Hospital Surge Capacity." *Academic Emergency Medicine* 13, no. 11 (November, 2006): 1153-1156.

156 C. Lam, et al. "The Prospect of Using Alternative Medical Care Facilities in an Influenza Pandemic." *Biosecurity and Bioterrorism* 4, no. 4 (2006): 385-392.

157 Joint Commission on Accreditation of Healthcare Organizations. *Surge Hospitals: Providing Safe Care in Emergencies.* Tennessee: The Joint Commission, 2006.

158 S. Cantrill, et al. "Alternative Care Sites." In *Mass Medical Care with Scarce Resources: A Community Planning Guide,* edited by S.J. Phillips and A. Knebel. Rockville, MD: Agency for Healthcare Research and Quality, 2007.

159 PriceWaterhouseCoopers' Health Research Institute. *Closing the Seams: Developing an Integrated Approach to Health System Disaster Preparedness.* New York, NY: PriceWaterhouseCoopers, October 2007.

160 S. Cantrill, et al. *National Hospital Available Beds for Emergencies and Disasters (HAvBED) System Final Report.* Rockville, MD: Agency for Healthcare Research and Quality, December 2005.

161 Ibid.

162 E. Toner, et al. "Meeting Report: Hospital Preparedness for Pandemic Influenza." *Biosecurity and Bioterrorism* 4, no. 2 (2006): 1-11.

163 Ibid.

164 National Association of Public Hospitals and Health Systems. *Research Brief: Hospital Staffing and Surge Capacity During a Disaster Event.* Washington, D.C.: NAPH, May 2007.

165 S.A. Lister and H. Stockdale. *Pandemic Influenza: An Analysis of State Preparedness and Response Plans.* Washington, D.C.: Congressional Research Service, September 24, 2007, http://www.opencrs.com/rpts/RL34190_20070924.pdf (accessed October 3, 2007).

166 Medical Reserve Corps. "About the Medical Reserve Corps." Office of the U.S. Surgeon General. http://www.medicalreservecorps.gov/About (accessed October 9, 2007).

167 Ibid.

168 National Association of County and City Health Officials. *NACCHO-MRC Capacity Building Cooperative Agreement.* Washington, D.C.: NACCHO, September 2006.

169 Health Resources and Service Administration. "Emergency System for Advance Registration of Volunteer Health Professionals – about ESAR-VHP." U.S. Department of Health and Human Services. http://www.hrsa.gov/esarvhp/ (accessed October 9, 2007).

170 M. Hall. "States Cutting Disaster Red Tape: Bills Seek Quick OK for Medical Help." *USA Today,* October 9, 2007.

171 U.S. Centers for Disease Control and Prevention. *Guidance Document for Continuation of the Public Health Emergency Preparedness (PHEP) Cooperative Agreements for Budget Period 8.* Atlanta, GA: U.S. Department of Health and Human Services, 2007.

172 California Department of Health Services, "2006 Surge Initiative," http://bepreparedcalifornia.ca.gov/EPO/CDPHPrograms/PublicHealthPrograms/EmergencyPreparednessOffice/EPOProgramsServices/Surge/2006SurgeInitiative/, October 17, 2007

173 U.S. Department of Health and Human Services. *Draft Guidance on Allocating and Targeting Pandemic Influenza Vaccine.* Washington, D.C.: U.S. Government, 2007.

174 Ibid.

175 A. Manning. "Scarce Pandemic Vaccine to be Given in Order." *USA Today*, October 22, 2007.

176 World Health Organization. *News Release: International Spread of Disease Threatens Public Health Security.* Geneva: WHO, 2007.

177 Ibid.

178 Ibid.

179 Trust for America's Health. *Pandemic Flu and the Potential for U.S. Economic Recession: A State-by-State Analysis.* Washington, D.C.: TFAH, 2007.

180 C.H. Schultz and K.L. Koenig. "State of Research in High-Consequence Hospital Surge Capacity." *Academic Emergency Medicine* 13, no. 11 (November, 2006): 1153-1156.

181 Association of State and Territorial Health Officials. *State Public Health Employee Worker Shortage Report: A Civil Service Retirement and Retention Crisis.* Arlington, VA: ASTHO, November/December 2003, http://www.astho.org/?template+2workforce_development.html (accessed October 31, 2007).

182 Association of State and Territorial Health Officials. *Preparedness Policy Fact Sheet: Pandemic and All-Hazards Preparedness Act Public Health Workforce FY08 Appropriation.* Arlington, VA: ASTHO, March 2007, http://www.astho.org/pubs/2007HillWorkforceAppropFactSheet2-27-07.pdf (accessed September 25, 2007).

183 Ibid.

184 Health Resources and Services Administration. "National Health Service Corps: 35 Years of Excellence: Access Today for Healthier Communities Tomorrow." U.S. Department of Health and Human Services. http://nhsc.bhpr.hrsa.gov/about/history.asp (accessed September 25, 2007).

185 Health Resources and Services Administration (HRSA). *What's Behind HRSA's Projected Supply, Demand, and Shortages of Registered Nurses?* Washington, D.C.: U.S. Department of Health and Human Services, 2004.

186 PricewaterhouseCoopers' Health Research Institute. *What Works: Healing the Healthcare Staffing Shortage.* New York, NY: PriceWaterhouseCoopers, 2007, http://pwchealth.com/cgi-local/hregister.cgi?link=reg/pubwhatworks.pdf (accessed September 21, 2007).

187 Ibid.

188 Ibid.

189 J. DeRusha. "Thanking the Responders to the Bridge Collapse." (WCCO) Minneapolis. http://wcco.com/local/local_story_256230152.html (accessed October 4, 2007).

190 Minneapolis Mayor's Office. "News Release: Response to I-35W Bridge Collapse showed Minneapolis is a City that Works." City of Minneapolis. http://www.ci.minneapolis.mn.us/mayor/news/20070815newsmayor_2008budgetmessage.asp (accessed October 4, 2007).

191 Office of the Inspector General. *The Commissioned Corps' Response to Hurricanes Katrina and Rita.* Washington, D.C.: U.S. Department of Health and Human Services, February 2007, http://oig.hhs.gov/oei/reports/oei-09-06-00030.pdf (accessed October 4, 2007).

192 Ibid.

193 U.S. Public Health Service. "About the Commissioned Corps." U.S. Department of Health and Human Services. http://www.usphs.gov/AboutUs/ (accessed October 4, 2007).

194 D.P. Andrulis, et al. "Preparing Racially and Ethnically Diverse Communities for Public Health Emergencies." *Health Affairs* 26, no. 5 (September/October, 2007): 1269-1279.

195 U.S. Centers for Disease Control and Prevention. "Centers for Public Health Preparedness (CPHP) Program, Network Activities, FY 2006 Collaboration Groups, Public Health Emergency Preparedness and Vulnerable Populations." U.S. Department of Health and Human Services. http://www.bt.cdc.gov/training/cphp/2006_Collaboration_Groups/PHEP_Vulnerable_Pop.asp (accessed September 28, 2007).

196 D.P. Andrulis, et al. "Preparing Racially and Ethnically Diverse Communities for Public Health Emergencies." *Health Affairs* 26, no. 5 (September/October, 2007): 1269-1279.

197 D. Markenson, et al. *Pediatric Preparedness for Disasters and Terrorism: A National Consensus Conference.* New York: National Center for Disaster Preparedness, Columbia University Mailman School of Public Health, 2003.

198 Trust for America's Health and the American Academy of Pediatrics. *Pandemic Influenza: Warning, Children At-Risk.* Washington, D.C.: TFAH, October 2007.

199 CDC communicated this to TFAH in private communication dated November 28, 2007.

200 C.M. Ashby. *Emergency Management: Status of School Districts' Planning and Preparedness, Statement before the Committee on Homeland Security, U.S. House of Representatives.* Washington, D.C.: Government Accountability Office, 2007, http://www.gao.gov/new.items/d07821t.pdf (accessed September 9, 2007).

201 www.GovTrack.us. "S. 1970--110th Congress (2007): Addressing the Disaster Needs of Children Act of 2007." *GovTrack.us (database of federal legislation)* <http://www.govtrack.us/congress/bill.xpd?bill=s110-1970> (accessed Oct 29, 2007).

202 S.R. Hawley, et al. "Mental Health Emergency Preparedness: The Need for Training and Coordination at the State Level." *Prehospital and Disaster Medicine* 22, no. 3 (May-June, 2007): 205-206.

203 C.L. Parker, et al. "Expanding Disaster Mental Health Response: A Conceptual Training Framework for Public Health Professionals." *International Journal of Emergency Mental Health* 8, no. 2 (Spring, 2006): 101-119.

204 U.S. Centers for Disease Control and Prevention. "Assessment of Health-Related Needs After Hurricanes Katrina and Rita: Orleans and Jefferson Parishes, New Orleans Area, Louisiana, October 17-22, 2005." *Morbidity and Mortality Weekly Report* 55, no. 2 (January 20, 2006): 38-41.

205 P. Whoriskey. "Hurricane Katrina Exacts Another Toll: Enduring Depression: Health Officials Cite Stresses of Rebuilding." *The Washington Post*, September 23, 2007, sec. A.

206 Ibid.

207 R.C. Kessler, et al. "Mental Illness and Suicidality After Hurricane Katrina." *Bulletin of the World Health Organization* 84, no. 12 (December, 2006): 930-939.

208 D. Abramson, et al. *On the Edge: Children and Families Displaced by Hurricanes Katrina and Rita Face a Looming Medical and Mental Health Crisis.* New York, NY: Columbia University's National Center for Disaster Preparedness and Operation Assist, April 2006.

209 Ibid.

210 R.M. Klevens, et al. "Invasive Methicillin-Resistant Staphylococcus Aureau Infections in the United States." *Journal of the American Medical Association* 298, no. 15 (October 17, 2007): 1763-1771.

211 M. Glod. "Kaine Requires Labs to Report Staph Cases, Monitoring Will Track Infection Trend." *The Washington Post*, October 25, 2007, sec. B.

212 L. Landro. "Wash Your Hands, and Don't Shave Your Legs: Advice to Avoid Infection." *The Wall Street Journal*, October 23, 2007, sec. D.

213 World Health Organization. "Tuberculosis Fact Sheet." WHO, Geneva, March 2007. http://www.who.int/mediacentre/factsheets/fs104/en/index.html (accessed October 29, 2007).

214 U.S. Centers for Disease Control and Prevention. "Multidrug-Resistant Tuberculosis (MDR-TB)." U.S. Department of Health and Human Services. http://www.cdc.gov/tb/pubs/tbfactsheets/MDRTB.pdf (accessed October 3, 2007).

215 U.S. Centers for Disease Control and Prevention. *Reported Tuberculosis in the United States, 2006.* Atlanta, GA, U.S. Department of Health and Human Services, September 2007.

216 Ibid.

217 K.G. Castro. *Protecting the U.S. from Drug-Resistant Tuberculosis: Reinvesting in Control and New Tools Research. Testimony of RADM Kenneth G. Castro, Assistant Surgeon General, before the U.S. Senate Committee on Health, Education, Labor and Pensions.* Washington, D.C.: U.S. Department of Health and Human Services, 2007.

218 Ibid.

219 C.M. Perlino. *Issue Brief: The Public Health Workforce Shortage: Left Unchecked, Will We Be Protected?* Washington, D.C.: American Public Health Association, 2006.

220 Health Resources and Services Administration. "Fiscal Year 2008 Justification of Estimates for Appropriations Committees." U.S. Department of Health and Human Services http://www.hrsa.gov/about/budgetjustification08/publichealthworkforcedevelopment.htm (accessed November 1, 2007).

221 Health Resources and Services Administration (HRSA). *What's Behind HRSA's Projected Supply, Demand, and Shortages of Registered Nurses?* Washington, D.C.: U.S. Department of Health and Human Services, 2004.

222 Health Resources and Services Administration. "Nursing Scholarship Program." U.S. Department of Health and Human Services http://bhpr.hrsa.gov/nursing/scholarship/ (accessed November 1, 2007).

223 Health Resources and Services Administration. "Nursing Education Loan Repayment Program." U.S. Department of Health and Human Services http://bhpr.hrsa.gov/nursing/loanrepay.htm (accessed November 1, 2007).

224 R.H.Gurwitch, et al. *Building Community Resilience for Children and Families*. Oklahoma City: Terrorism and Disaster Center at the University of Oklahoma Health Sciences Center, 2007.

225 Hurricane Katrina Community Advisory Group. *Overview of Baseline Survey Results: Hurricane Katrina Community Advisory Group*. Cambridge, MA: Harvard Medical School, 2006.

226 35A Am. Jur. 2d Federal Tort Claims Act ≠ 282

227 Center for Law and the Public's Health. "Uniform Emergency Volunteer Health Practitioners Act." Georgetown and Johns Hopkins Universities. http://www.publichealthlaw.net/Resources/Modellaws.htm#UEVHPA (Accessed October 28, 2007)

228 CO, CT, DC, IA, KS, KY, ME, MI, MN, MO, NB, NH, NJ, NY, NC, OR, SC, TN.

229 AL, CA, GA, HI, IL, IN, LA, PA, SD, UT, VA, WV

230 AK, AR, AZ, DE, FL, ID, MD, MA, MS, MT, NV, NM, ND, OH, OK, RI, TX, VT, WA, WI, WY

231 Note that CT extends the reach of its law to mental health professionals.

232 U.S. Centers for Disease Control and Prevention. *Guidance Document for Continuation of the Public Health Emergency Preparedness (PHEP) Cooperative Agreements for Budget Period 8*. Atlanta, GA: U.S. Department of Health and Human Services, 2007.

233 U.S. Department of Health and Human Services. "State Pandemic Influenza Operations Plans." U.S. Government. http://www.pandemicflu.gov/plan/states/stateoperatingplan.html (accessed October 3, 2007).

234 U.S. Department of Health and Human Services. *News Release: Public Health Advisory Board Established to Advise HHS Secretary on Chemical, Biological or Radiological Agents*. Washington, D.C.: DHHS, June 19, 2007.

235 U.S. Centers for Disease Control and Prevention. *FluAid*. Vol. 2.0. Atlanta, GA: 2000.

236 Homeland Security Council. *National Strategy for Pandemic Influenza*. Washington, D.C.: The White House, 2005.

237 U.S. Centers for Disease Control and Prevention. "Key Facts about Seasonal Influenza (Flu)." U.S. Department of Health and Human Services. http://www.cdc.gov/flu/keyfacts.htm (accessed October 12, 2007).

238 U.S. Census Bureau. "Population Estimates Program, 2006 Population Estimates, Generated by Serena Vinter using American FactFinder." U.S. Government. http://factfinder.census.gov (accessed October 5, 2007).

239 U.S. Census Bureau. *Current Population Survey, 2007 Annual Social and Economic Supplement, Health Insurance Coverage Status by State for all People*. Washington, D.C.: U.S. Government, 2007, http://pubdb3.census.gov/macro/032007/health/h06_000.htm (accessed October 5, 2007).

240 American Hospital Association. *American Hospital Association Health Statistics*. Chicago, IL: Healthcare InfoSource, 2006.

241 J.P. Stevens. *Applied Multivariate Statistics for the Social Sciences*. 4th ed. Mahwah, NJ: Lawrence Erlbaum Associates, 2002.

242 American Hospital Association. *American Hospital Association Health Statistics*. Chicago, IL: Healthcare InfoSource, 2006.

243 Energy Information Administration. *U.S. Census Regions and Divisions – 2000*. Washington, D.C.: U.S. Government, http://www.eia.doe.gov/emeu/reps/maps/us_census.html (accessed August 17, 2007).

244 J.P. Stevens. *Applied Multivariate Statistics for the Social Sciences*. 4th ed. Mahwah, NJ: Lawrence Erlbaum Associates, 2002.

1707 H Street, NW, 7th Floor
Washington, DC 20006
(t) 202-223-9870
(f) 202-223-9871